THE IRON AGE

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Unique Conveyor in Automobile Plant

Overhead Lamson System Resembling a Cash Carrier Transports Motor Car Bodies Between Buildings at Studebaker Plant

The very large size of some of the automobile manufacturing plants, the great amount of ground space occupied and the haulage of vast quantities of material in the process of manufacture have resulted in the installation of various special conveying equipments to make possible the rapid transportation of parts over a considerable distance from one building or one section of a plant to another to keep the manufacturing operations in progress without delays and to reduce the handling cost to a minimum. A unique conveyor system designed to perform quite unusual service has recently been installed at the Detroit plant of the Studebaker Corporation. The problem presented and which was worked out by the construction department engineers of the Studebaker Corporation and the Lamson Company, Boston, Mass., that installed the conveyor, was to provide a system for carrying automobile bodies and assembled wheels from the first floor of the enameling, body finishing, wheel assembling and finishing and electrical unit assembling building to the fourth floor of the final car assembling building. The two buildings are approximately 850 ft. apart and between them run the main tracks of the Pere Marquette and Wabash railroads. To provide an overhead carrier, it was necessary to place the runway above these railroad tracks, over a corner of the carbarns of the Detroit United Railway and over the roofs of four Studebaker plant buildings.

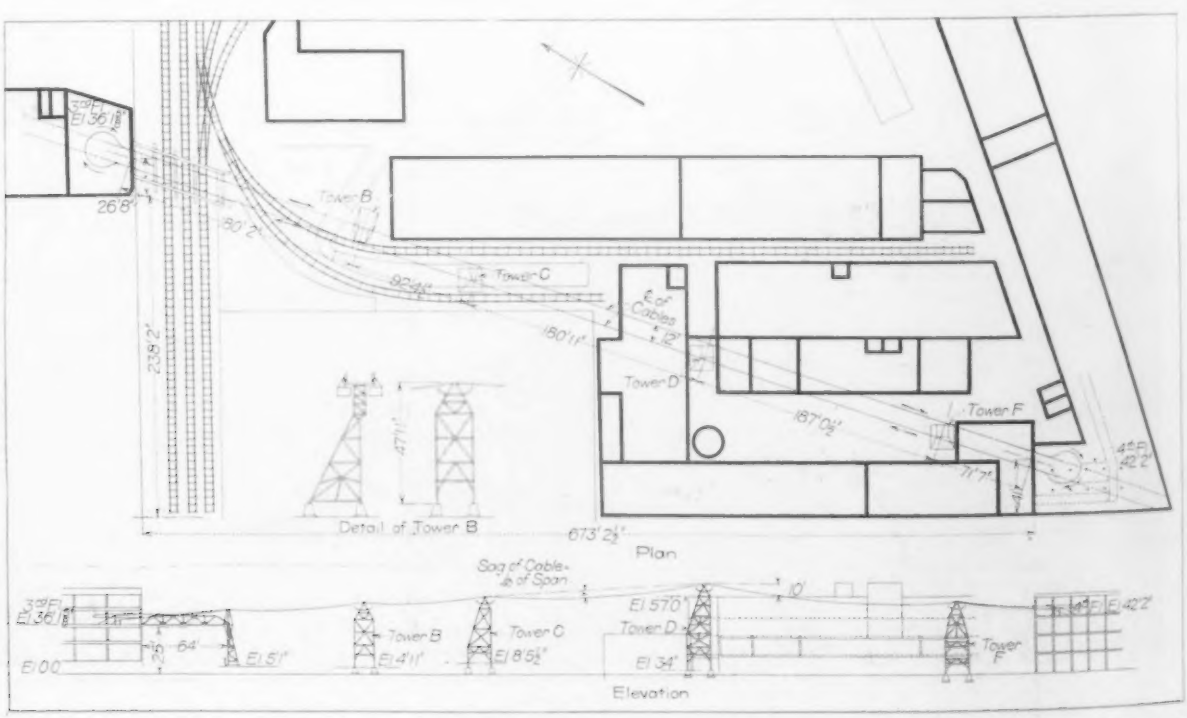
The conveyor system finally decided upon and installed resembles in its general principles the

A General View of the Carrier System from One Side Showing Four Cars in Transit. The Loaded Car in the Left Background and the Empty One in the Center Are on the Down Grade and Are Helping to Pull the Two Loaded Ones Uphill

The Stationary Loop in the Assembling Building. At the Left Is a Carrier That Has Stopped on the Loop and Is Awaiting the Removal of the Automobile Body It Contains, while at the Right a Car Is Starting Back Empty. The Driving Motor and Take-Up Mechanism Are Located in the Railed Enclosure in the Center

familiar Lamson cash carrier system used in department stores. It includes a stationary cable track and cars propelled by an endless cable, the cars passing into the upper floors of the two buildings on a stationary loop and being loaded and unloaded while standing in this loop. The two buildings, one at the third floor and the other at the fourth floor, are connected by a double cableway track made of 1¼-in. Roebling cable firmly anchored to the steel framework of both buildings. The cable has a tension of 30,000 lb. and is supported in inverted saddles on five steel towers built up from the ground. The cable track starts 36 ft. above grade and ends at 65 ft. above grade. The highest or center tower is 90 ft. in height and the longest space between towers is approximately 200 ft. The high towers serve the double purpose of bringing the runway above the high factory buildings and providing an incline so that the cars that have passed the peak can help pull those that are on the upgrade.

Above the stationary cable runway is an endless ¾-in. cable that loops around idlers at the starting end and over sheaves and a tension carriage and



Plan and Elevation of the Cable Runway Showing the Relative Locations and Heights of the Supporting Towers and the General Form of Their Construction

Photograph of a Car Nearing Its Destination in the Assembling Building. This View Shows One of the Towers Supporting the Cable Runway, Tower F, in the Foreground with a Portion of Tower D in the Background. The Location and Relative Elevations of the Towers Are Shown on the Opposite Page

around the driving gear at the receiving end in the final assembling building. Two 18-in. steel wheels at the top of the cars provide a runway for the cars on the cable track. The cars are hooked to an endless cable by a cam-actuated gripping motion which operates automatically when the car leaves one of the stationary inclined loops at either end of the stationary cable track. When the loaded car comes off the cable track on the stationary loop the grip is automatically released and a brake applied. After being unloaded the brake is released and the car moves by gravity around the inclined loop, and when it reaches the end of the loop it automatically engages itself to the endless cable and starts back for another load. The loops are 26 ft. in diameter. Beneath the portion of the cable track that spans the railroad tracks a structural steel guard was erected as a safety measure. This is shown in the foreground of one of the accompanying illustrations. The endless cable is driven by a 10-hp. motor with a gear reduction to the cable winding driving drum. The motor is located within the loop at the receiving end of the carrier system.

Six cars are used for carriers. These are of all

Rear View of a Car That Has Just Left the Loading Station Showing the Structural Steel Guard That Has Been Built Under the Runway Above the Railroad Tracks

steel construction with open ends, 9 ft. long, 5 ft. wide and 45 in. high in the clear, providing ample space for a large car body. They have a capacity of 1500 lb. each. It takes 2½ min. for a loaded car to make a trip from one building to the other, and the cars come in at the rate of one every minute. Two men are employed at each end of the conveyor for loading and unloading. As the system is automatic in operation, it requires practically no attention from the men. Automobile bodies are shoved on and off the cars on wooden skids. Wheels are carried on the cars on trucks, fourteen wheels with the tires mounted being placed on a truck, which is then pushed on the car. The system has proved not only an economical method of handling, but is said to have proved particularly satisfactory in that finely polished automobile bodies are handled without a scratch. Under former methods scratching of bodies in handling was not uncommon.

The towers were designed and built by the Wisconsin Bridge Company, which also built the cars from the design of the Lamson Company.

Grinding Center Bosses from Shrapnel

To remove the center boss that is sometimes left on the rear end of a shrapnel shell to enable it to be finished, the Ransom Mfg. Company, Oshkosh, Wis., has developed a special type of jig for use in connection with its disk grinding machine. The boss is removed after the lathe work has been done and its position on the shell is clearly brought out

Removing the Center Boss from a 3-In. Shrapnel Shell on a Disk Grinding Machine Using an 18-In. Ring Type Wheel and a Special Jig. Above the Machine Is Shown a Shell in Section Before the Boss Is Removed

in the upper portion of the accompanying illustration while the main part shows the boss being removed on a disk grinding machine using an 18-in. ring type wheel.

In finishing shrapnel in this way the shell is placed in a special V block without clamps. The operator brings the shell, which in the case shown is 3 in. in diameter, up against the abrasive ring wheel by a lever, the stop preventing the shell from being fed too far into the grinding wheel. To insure even wear of the wheel, the table holding the jig and the shell is arranged to swing freely on the large shaft underneath the table so that it can be rocked back and forth across the grinding wheel.

Influence of Phosphorus on the Properties of Gray Cast Iron

A long discussion by F. Wüst and R. Stotz, entitled "The Influence of Phosphorus on the Mechanical Properties of Gray Cast Iron," in the April and May issues of *Ferrum*, a German technical journal, presents the following conclusions:

1. The static properties of gray cast iron are favorably influenced by small additions of phosphorus up to 0.3 per cent. An unfavorable effect is detected with a phosphorus content over 0.6 per cent.

2. The dynamic properties are deleteriously influenced by phosphorus up to 0.6 per cent. Higher phosphorus percentages cause only a slightly increasing detrimental effect.

3. The influence of phosphorus is not essentially changed by the presence of other admixtures. Smelting with rich manganese ingredients especially indicates no greater effect than when using ingredients poor in manganese. The experiments clearly indicate that even cast iron, rich in phosphorus, can be benefited by a manganese content 1 per cent and over if the other ingredients are correctly selected.

4. The structure of cast iron is affected by the addition of phosphorous in three ways: When the graphite collects in nests; when a phosphorus-bearing ternary eutectic appears and when the pearlite undergoes a disintegration into a mixture of large laminated pearlite and sorbite.

Memorial Meeting to F. W. Taylor

A memorial meeting to the late Frederick W. Taylor is to be held under the auspices of the Society to Promote the Science of Management at Houston Hall, University of Pennsylvania, Philadelphia, on Friday evening, Oct. 22. Among others, appreciations are expected from Prof. A. Wallichs, Royal Polytechnical School, Aix-la-Chapelle; Henri Le Chatelier, Charles de Freminville, Paris; Director Charpy of the St. Jacques Steel Works, and Prof. J. J. Sederholm, University of Helsingfors, Finland.

On Saturday the members of the society are to be received for luncheon by Mrs. Taylor at the Chestnut Hill home of Mr. Taylor. On Saturday afternoon a paper is to be read by Richard A. Feiss of the Clothcraft Shops in Cleveland, giving details of the social service work of his company. An evening session is also scheduled.

Increased Exports of Ferrovanadium

Exports of ferrovanadium from the United States have increased considerably, due probably to war conditions. In June they were 92,667 lb., against 51,410 lb. in June, 1914, an increase of 44 per cent. For the fiscal year they were 755,905 lb., against 626,641 lb. in the preceding fiscal year and 559,443 lb. in that of 1913.

The Harrisburg Water Laboratories have been organized for the chemical and bacteriological examination of water, sewage, trade wastes and other associated substances. The organization consists of Lesley McCreath, junior member of the firm of Andrew S. McCreath & Son, analytical and consulting chemists, Harrisburg, Pa., who still retains his interest in that firm; Dr. George R. Moffitt, city chemist and bacteriologist at Harrisburg and head of the Moffitt Bacteriological Laboratory, and Farley Gannett, consulting engineer, and lately engineer of the Water Supply Commission of Pennsylvania.

The new Employment Bureau of the State of Pennsylvania will open Oct. 1. Authorized by the last Legislature, this new department will endeavor to act as a clearing house for labor. Headquarters will be maintained at Harrisburg, with branches in all the principal industrial centers of the State. Representatives of employers, labor unions and employment bureaus met in Philadelphia recently to discuss the organization of the bureau.

Continuous Rotary Heat-Treating Furnace

On a Revolving Floor Under a Mushroom Cover 50,000 lb. of Springs Heated Daily at Plant of Detroit Steel Products Company

BY F. M. PAULL

To insure a continuous and absolutely even high temperature in heat treating automobile springs, the Detroit Steel Products Company has installed in its plant at Detroit, Mich., what is really a mammoth oil-burning rotary furnace. The furnace, which was designed and built by the plant engineer, has the general appearance of a mushroom with the stem cut off. It is 26 ft. in diameter and therefore 81.7 ft. in circumference, and is the only furnace of its kind in existence. The floor is revolved electrically, making one complete revolution in 20 to 30 min. The speed, however, can be regulated by a variable speed motor.

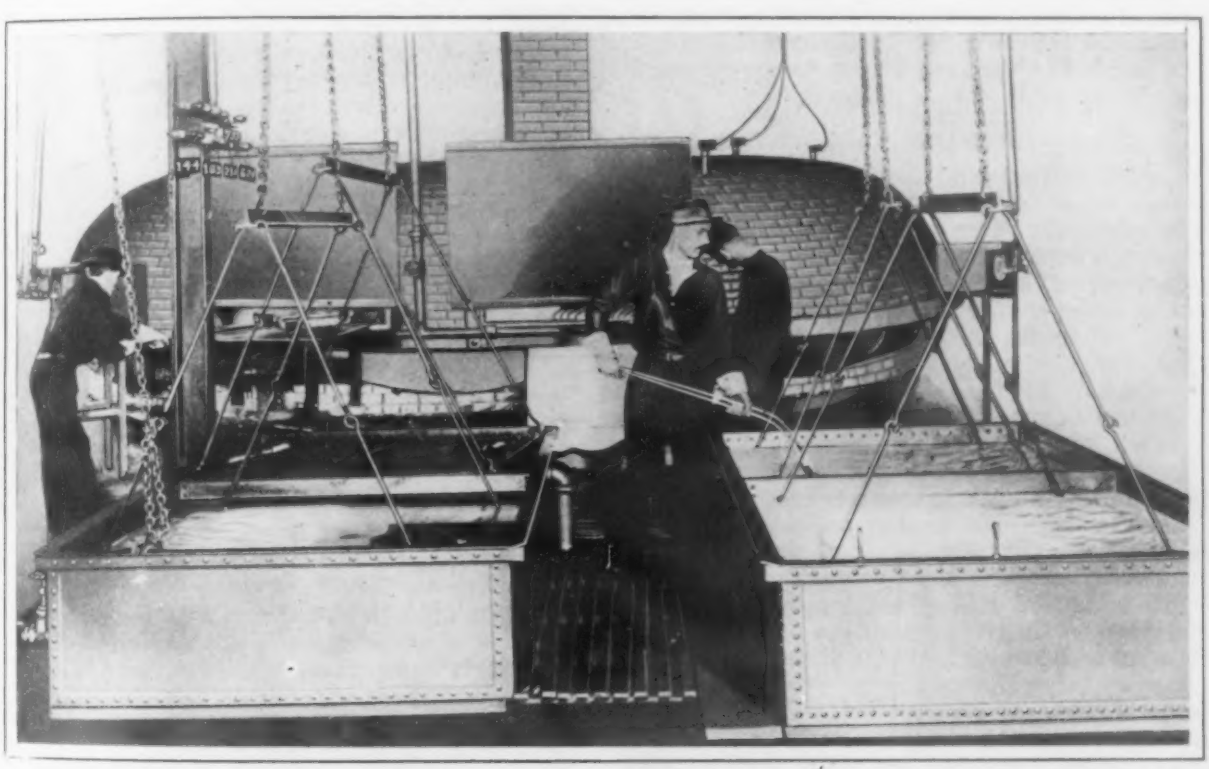
Jets of air and fuel oil placed at intervals around the outside circumference shoot at high velocity into the furnace through vents left in the walls. The oil is ignited through contact with the heated interior of the furnace, keeping its temperature at 1450 deg. to 1575 deg. Fahr. Pyrometer couples register the temperature, and an electric signal board notifies the operator whenever the temperature is likely to get too high or too low. This enables the operator to keep the furnace at an even temperature.

To treat a large output of springs in the old type of furnace, it was necessary to heat the furnace to a considerably higher temperature than that desired for the springs themselves. The steel was brought to the required temperature quickly and removed before it became too hot. The rotary furnace is heated only to the temperature required in the steel. The steel attains this heat slowly and remains in the furnace only till it reaches the exact temperature. There is no opening and closing of doors to cause intermittent drafts and make the temperature difficult to control. One small door is sufficient.

One crew of men is kept busy removing the heated plates as the revolving floor brings them into position, while another crew inserts other leaves. The new furnace does the work of four or more ordinary furnaces. Its operation requires seven men, and it treats about 50,000 lb. of steel per day.

The springs to be treated are placed cold on the revolving floor. During the revolution they gradually attain the maximum heat of the furnace. They are taken out at the end of the revolution and hardened in oil baths, the oil being kept at an even temperature through the agency of an air and water circulating system, which maintains a temperature of about 90 to 120 deg. Fahr. The oil flows from the bath to submerged tanks under the floor of the factory building. From here it is pumped through an elaborate system of pipes on the roof. These pipes have two compartments, one for water for cooling purposes and one for the oil. The oil after passing through the pipes is then returned to the baths at the temperature required.

After leaving the baths the springs, which have been treated in the rotary furnace, are passed on to the "draw" furnaces. Passing through these furnaces on an endless chain conveyor for 30 min. at a maximum temperature of about 900 deg. Fahr., the temper or hardness is modified to give the metal the necessary tensile strength and ductility required by the severe service that is given to an automobile spring.



Heat Treating Furnace 26 Ft. in Diameter with Rotating Floor. It Is Loaded and Unloaded from Stationary Points and Makes a Complete Revolution in 20 to 30 Minutes

Machining and Assembling Shrapnel Cases

The Different Machines Which May Be Used and Methods Practised—Some Light on the Scope of the Inspection Work

BY C. A. TUPPER*

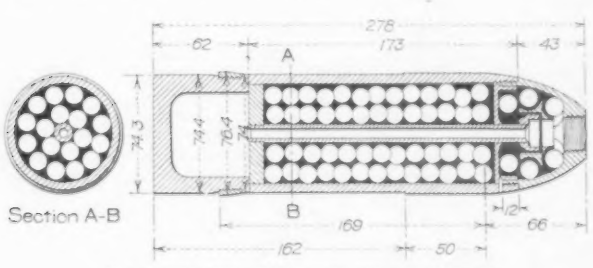
In the machine work on shrapnel cases there is a great deal of opportunity for economy if a study of the plant equipment is entered upon and a systematic effort made to get the utmost possible returns from the existing facilities before providing for any additions or improvements. This can be best illustrated by a description of the necessary operations, with reference to the tools on which they are carried out.

When the forgings are received at the machine shop the first operation on each consists of trimming and reaming the open end. For this any type of pipe or other cutting-off machine can be used, even a lathe. A simple fixture suffices for the reamer. Machines especially designed for the work were described in THE IRON AGE, June 13, page 1225, and July 22, page 193.

The length of the shell body is determined by gaging from the interior surface of the base, which forms the bottom of the powder pocket. In laying out the work a surface plane, vertical gage mandrel and needle-point marker are used.

MACHINING THE BASE EXTERIOR

After cutting and trimming the base exterior is rough machined. This can be accomplished with any apparatus which will hold a facing tool while the work is passed before it. The most economical rig, however, has been found to be a gang miller, using either vertical or horizontal cutter heads or both. With the use of the vertical spindles the operation is similar to that which has been very successfully employed for facing off gas engine cylinders in multiple. The forgings are similarly secured by means of fixtures arranged suitably on the traveling table and they pass successively under the milling cutters. In this way continuous milling is accomplished by keeping some of the fixtures always under cut while the others are being emptied and reloaded. The same purpose can be effected with horizontal milling cutters by clamping the forgings on their sides with the bases facing outward at each longitudinal edge of the traveling table so as to bring the cutters on either edge against each in turn. If vertical spindles are also used a suitable proportion of the work will be clamped upright between the two horizontal rows of shells.



A Late Design of French Shrapnel Shell

Should a lathe be employed in facing off the base it will be economical to select one of the greatest swing available, and have it carry a wide circular chuck which will present a succession of shell bases to the facing tool with each revolution.

*Consulting engineer, Chicago.

MACHINING THE CYLINDRICAL SURFACE

The cylindrical surface of the body is then rough turned as far as the nose and a roughing cut taken for the band seat. This can be accomplished on any type of turning machine, horizontal or vertical, and it is difficult to say which has been found the most effective for the purpose. Turret lathes or engine lathes fitted with turret tool posts are now, however, the most generally utilized. In fact, the multiple tool post has been found a necessity for this class of work in order to avoid any more settings than are absolutely necessary and to insure no delays between operations. After roughing, a finishing cut is taken above the driving band.

All sorts of lathes large and small have been adapted to the purpose, and engine lathes have in some cases been made double machines by means of a driven headstock at either end with tool posts between. The shells are held by being forced upon mandrels fitted in the face plate, and where the inside diameter of the forging is slightly oversize an expanding mandrel is used. The latter, in fact, has advantages for invariable use in connection with the operations described.

The base of the shell case is now faced off smooth and a finishing cut is taken on the cylindrical surface at the base end together with the rounding off (making "radius") at the base edge. If reset for these operations on another lathe, a split-collet chuck is used in place of the mandrel.

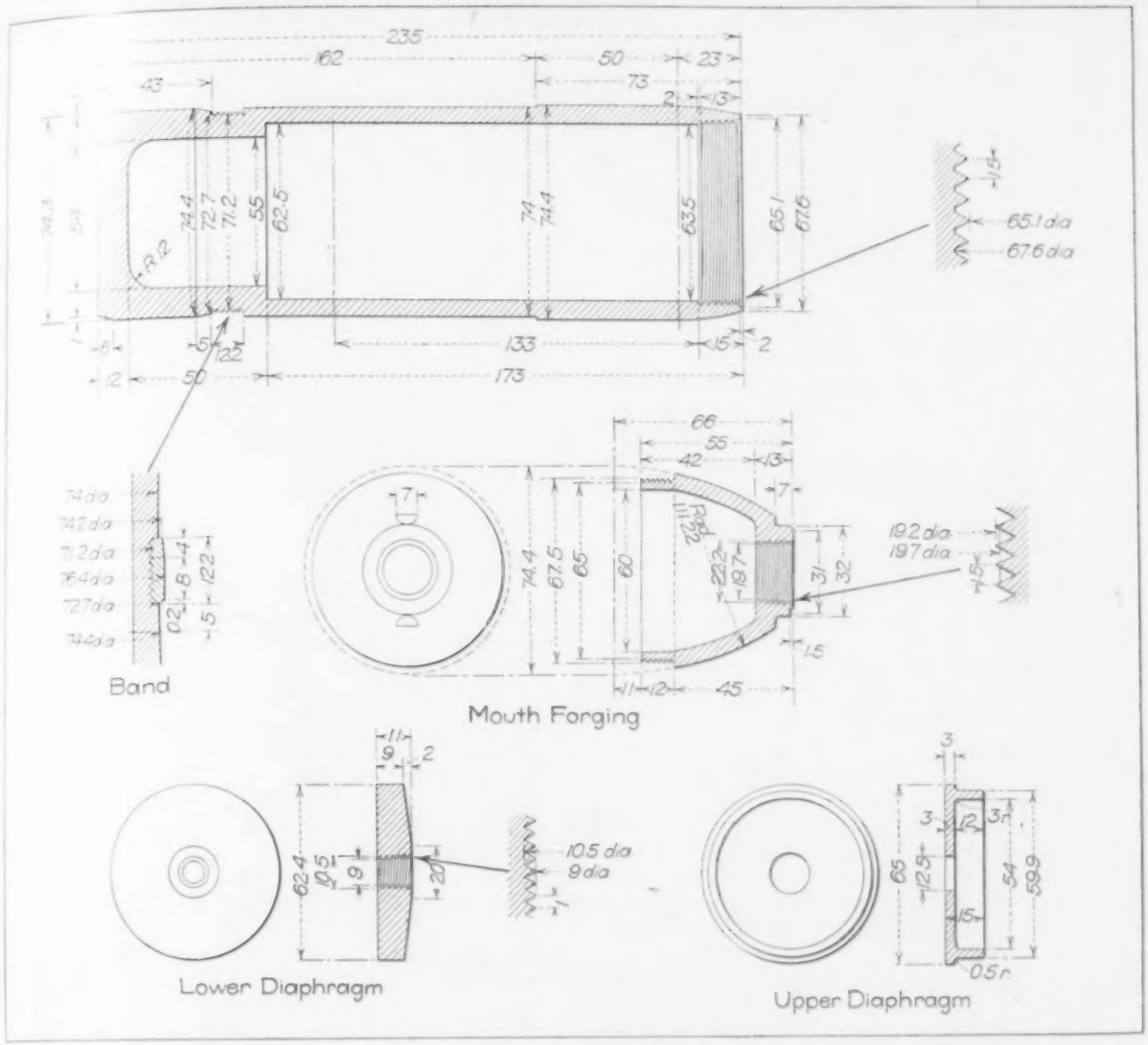
THE WAVE FOR THE RIFLING BAND

The groove for the driving band is then finished (and may also be roughed out at this point), followed by what is known as waving. In order to prevent the band from slipping and spoiling the rifling motion when the shell is fired, it is secured by being forced into a double "wave" or undulating groove within the band groove. To control the motion of the double V-faced square-head tool for cutting this wave there are various cam-operated devises. For one of the simplest and most effective a special lathe tool rest is used, consisting of a lower slide mounted directly on the carriage with cross adjustment. On this lower slide there is a tool slide which, in order to give the wave effect, has imparted to it a reciprocating motion parallel with the bed while the work revolves. This, with other attachments designed more especially for use on high-explosive shell cases made from solid bar-stock, was described fully in THE IRON AGE, June 24, page 1395.

To hold the work in a standard lathe for the waving cut a chuck is used which admits the shell body close up to the tool. Special adaptability for this operation has been found in "manufacturing automatic" chucking machines.

METHODS AND EQUIPMENT FOR BORING

The shell is now ready for boring, although in some shops this process takes place prior to the machining of the cylindrical body surface. The first boring operation consists of forming the pocket for the cups and the seat of the steel disk or diaphragm, both roughing and finishing cuts being taken. This



Details of Parts of 75 Mm. French Shrapnel Shells

necessitates four different tools, the second used on the diaphragm seat being a reamer. If the work is performed on a lathe they can be set in the turret tool post and brought successively into play. Flat turret lathes have been particularly successful.

A better method, however, seems to be to reserve the lathes for strictly turning operations and to do this work in boring or drilling machines. With a multi-spindle drill having four to twelve heads, it is apparent that from one to three complete operations, i. e., two roughing and two finishing cuts each, can be proceeded with simultaneously. All kinds of drills and boring bars are, however, being utilized.

With a lathe or boring bar there is the advantage at this point of being able to simultaneously face the open end, which is otherwise the operation next in order, but it is a light operation that can readily be performed singly or in multiple with a cutting tool held against the work by almost any device.

In this connection it should be stated that, where new equipment for shell manufacture is required, the tendency has been lately to order single-purpose tools, the advantages of which are obvious. A lathe of very simple type designed for use by non-skilled labor was described in the issue of Aug. 5.

The subject of chucking is also one of an importance not to be underestimated. Rapid and accurate centering, with a grip sufficient to enable roughing cuts to be taken in depth at a fair speed, are vital factors of quick production here as in all other similar work. Where the grip is an external one the problem is relatively simple. Split collet chucks probably give the most satisfactory service in general, although jaw and hinged chucks are also largely used. A steady head helps considerably. With an internal mandrel, however, care has to be taken to insure a firm, non-slipping adjustment.

When the preliminary machining has been accomplished the shells are painted with a non-oxidizing compound and then sent to the furnace.

EQUIPMENT FOR HEAT TREATMENT

Heat treatment for annealing and hardening does not differ materially from other standard practice, except as to detail. Any type of annealing furnace capable of high temperatures and sustained, regulated heat can be utilized. Those in service range from small muffle furnaces up to units of considerable size such as are used for large forgings. The use of the last named is naturally the most economical; for, in addition to the ordinary operating advantages, it is possible to arrange the shells on trucks and run them into a furnace in considerable quantity for simultaneous treatment. Oil, gas or powdered fuel firing is usual, with control by electric pyrometers. An innovation for heating shell cases is also the use of a continuous heating machine, such as has been utilized for the treatment of springs and small

machine parts. This can be made with a carrying device adapted to shrapnel cases and the oil bath similarly equipped.

After being brought to a temperature of about 1500 deg. Fahr. the shells are removed and quenched in oil. If the top of a furnace truck, where used, has a removable rack, this can simply be lifted off by a small crane, submerged in the oil bath and raised again. A screen bottom in the oil tank, which can be lifted out with the shells, serves the same purpose. If required the shells are then subjected to a milder annealing heat, varying with the carbon content but averaging about 750 deg. Fahr., and placed in a tempering bath.

If small furnaces are used and the shells handled one at a time with tongs, it is customary to dip them in the bath at an angle, so as to submerge the open end, and then to reverse this process to bring the base in the oil.

ELECTRIC HEATED OIL BATHS

The method introduced in some plants, not long ago, of heating oil baths by means of an electric coil has been given decided impetus in shrapnel manufacture. For the final operation it is possible with this means practically to insure a uniform temper in the shell steel. This results from the precision of the control and the automatic character which it assumes. Because of the latter, also, it is not necessary to keep a skilled man in constant attendance on the oil bath.

The dangers of cracking, warping and shrinking which occur in the hardening process are those incident to all such operations and the usual precautions have to be taken. Perfect control of both furnace and oil bath is naturally an important element of success.

After hardening and tempering the shells are given a soda water wash and cleaned.

The Brinell or scleroscope test for hardness is next applied. With the use of a scleroscope the shell can be inverted over a cone, perpendicular to the instrument, so dimensioned and placed that the testing sector is always equidistant from the base of the shell. At least three points on the circumference are taken for the test. If held in a vise the shell is first marked or "spotted," to show the exact sector to bring under the rebounding element.

SAND BLASTING THE SHELL

The shell is then cleaned by means of a sand blast both inside and out, with particular reference to the chamber and driving band groove. Some very ingenious arrangements for this purpose have been devised, but in practically all of them for quantity production use is made of a blast chamber and multiple nozzles, with the flow of sand so directed that it acts upon the interior and exterior of the shell simultaneously through sets of nozzles suitably placed at right angles to each other.

After being thoroughly cleaned the shell is ready for nosing. At some stage of the turning or facing process, which will vary with the arrangements in different shops and may take place as early as the finishing cut on the body, the cylindrical surface at the edge of the open end has been slightly tapered off. The shell is now heated for about one-half its length, the powder cup placed and the steel diaphragm quickly inserted so as to insure a close fit for the latter from the subsequent shrinkage of the shell.

NOSING THE SHELL

For nosing, the shells are heated in a furnace with protected side openings or in a lead pot, the metal bath in which stands continuously at 1400 deg. Fahr. In order to hold the shells in place in the latter there is commonly a cover plate with openings through which the shells are suspended. This cover is circular and rotates so as to permit a new shell to be placed in the pot as each one is taken out for the nosing operation.

For that purpose any type of machine exerting sufficient squeezing impact or pressure can be used, but a number of special presses have recently been devised for the purpose which insure the quickest and most accurate results. (See THE IRON AGE, Aug. 17, page 417.) A swaging machine, which delivers blows in rapid succession, to "knead" the nose into shape, can be utilized.

A final annealing then takes place, as the nosing operation is apt to make the steel of the shell brittle at that point. This annealing can be most simply done by suspending the shells over pins in another lead bath. The shell, after removal from the pit or furnace, is allowed to cool slowly in suitable packing.

The shell is now subjected to a further process of sand blasting for the purpose of cleaning away any scale or refuse adhering from the heating process.

BANDING THE SHELL AND FINAL MACHINING

The copper band, rolled and cut to size, is forced on and crimped in place by a hydraulic press. One especially suited to this purpose was recently described in THE IRON AGE. The band is then turned, by two special formed cutters, on a small speed lathe.

The final machining operations in their successive order are turning the exterior surface of the nose, boring it, facing and tapping. This work is quickly done on turret or other lathes with varied tool post attachments. Automatic "manufacturing" lathes are well adapted to it and enable a high rate of production to be maintained.

The outside turning and facing tool is given its proper motion by means of a slotted disc attached rigidly to the bed of the machine. This cam slot fixes the movement of a roller which is secured to the lathe cross-slide and thus guides the two so that the resultant motion of the tool gives just the right taper to the shell. The roller is held securely to the guilding face by weights and the feed of the tool is regulated by stops.

The final finish, if required, is given by grinding, and an extreme refinement is the further use of a rag buffing wheel. For grinding, the shells are base chucked and carry a centering plug in the open end. A grinder traverse provides for the work on the body and the shell is then passed to another machine with a formed wheel for the nose. The latter will take care of the output of two plain grinders, so that three machines make a finishing unit.

In cutting the thread for the socket seat of the nose a collapsible tap is now generally used in order to avoid the necessity of reversing the spindle roughed out in one cutting, using a multiple drill, and finished in on the lathe, although with good and thus backing out. Sometimes the threads are tools this hardly seems necessary.

The socket, to which a central tube communicating with the chamber is afterward attached, and which also forms the seat into which the cap is screwed, has meanwhile been manufactured and is now screwed in place, and the nose once more lightly faced, to remove any inequality or burr.

The tube is next screwed in the steel diaphragm, both having formed separate articles of production designed to mate with each other.

COMPLETING THE SHELL

At this point the balls are placed in the annular space surrounding the central tube and all interstices filled with resin or some bituminous substance which will act as a suitable binder. For packing there are a number of mechanical contrivances which lessen the labor and tend to insure more reliable results. These include a feed spout from an overhead bin for filling, a jarring plate for ramming the balls down solidly into place and electric melting pots which can be so exactly regulated as to keep the resin continuously at just the right temperature.

Next the upper end of the tube is soldered to the socket by means of an annular copper binding strip. Three coats of weather proofing paint are then applied, usually by some mechanical process. One was described in THE IRON AGE, April 8. A method of spraying was described in THE IRON AGE, Aug. 12.

The shell case is then ready to be filled and the cap screwed on. This, however, is done just before service and the cap forms an entirely separate and distinct article of manufacture with which the present article has nothing to do.

THE MATTER OF INSPECTIONS

The unit of production is 120 shell cases and all official tests are made on that basis, one out of each lot being sent to the arsenal for service test and one to have a section cut for the required tensile test. The first official inspections take place, however, just before or after the boring of the cup and diaphragm seat. If there is the least sign of a structural defect which indicates a pipe or other flaw, the shell case is rejected, as any leakage of air through the metal at the base would cause the explosion of the powder in the pocket and consequently of the shell in the gun. The next inspections come after heat treatment and nosing, respectively.

Shop inspections, however, should be very thorough all the way through, and careful gaging is made obligatory by the nature of the operations. The gages used for the purpose make measurements principally as follows:

1. From inside of base cavity to cut-off point at open end.
2. For thickness of base, depth and diameter of powder pocket and diameter of diaphragm seat.
3. For diameter of base.
4. For annular band groove, including waving cut.
5. For finished diameter above and below band.
6. For contour of nose.
7. For thickness of nose wall at base of socket seat.
8. For overall length.

All of these involve maxima and minima and divisions of measurements; that of the band groove, for example, involving no less than five plus and minus, i. e., double, gagings. Hence the total number may reach 42 or more. In some shops the inspection is naturally carried to a much finer point than in others. Snap gages are used as far as possible.

A full set of gages should be secured from some firm making a specialty of them, and they ought to be manufactured according to the specifications of the country for which the shells are intended. It is a mistaken economy to attempt to make these gages in the ordinary tool room.

The test piece cut for the tensile test is a very elaborate affair, which is sawed out, drilled, slotted, milled, etc., to a shape exactly conforming to accepted practice. The specifications for this piece must be rigidly adhered to and precise instructions will be given the contractors from the proper official source.

It is also highly desirable, through the entire process of shell manufacture and shop inspection, to follow out any recommendations and suggestions made by the other parties to the contract, as their experience in the production or use of such material puts them in a position to give extremely practical advice. Furthermore, it tends to minimize rejections and to prevent any disputes or misunderstandings when deliveries are made.

Employing a Camera to Read Meters

A recent industrial application of photography is the Factograf camera which has been developed by the Eastman Kodak Company, Rochester, N. Y. This is designed to read gas, electric and water meters and provide a record that cannot be questioned. In taking the readings, the front of the camera is placed against the meter dial and the exposure lever pressed. This automatically turns on a light which is supplied by two four-cell dry batteries to four 3.8 volt miniature Tungsten lamps, opens and closes the shutter and turns off the light. After the exposure has been made the shutter locks automatically and remains so until the film for the next exposure has been wound into place when it is automatically released. In this way the possibility of double exposure and blank films is guarded against as once the film has been put in position, it cannot be wound up until after the exposure has been made.

A film will take 75 exposures and storage space for two extra rolls is provided, thus enabling films for 225 readings to be carried within the body of the camera. By pressing a small button located below the exposure lever, the lights can be turned on, converting the camera into a flashlight for locating meters in dark places. If desired, cards bearing the reader's name, route number and date can be placed against the front of the camera and photographed to identify the record.

Large Increase in Lake Iron-Ore Shipments

Shipments of iron ore down the Lakes from the Lake Superior region in August amounted to 8,081,117 gross tons, as compared with 5,869,477 tons in August, 1914. The following table gives the August and season shipments by ports and the corresponding figures for 1914 in gross tons:

	August, 1915	August, 1914	To Sept. 1, 1915	To Sept. 1, 1914
Escanaba	933,162	724,951	2,995,862	2,465,692
Marquette	659,293	368,430	1,773,653	1,049,791
Ashland	931,324	662,951	2,801,219	2,079,776
Superior	1,375,086	1,886,418	4,439,088	7,576,831
Duluth	2,668,070	1,203,081	9,378,530	4,152,367
Two Harbors	1,514,362	1,023,646	5,418,068	3,953,650
Total	8,081,117	5,869,477	26,806,420	21,278,107
Increase	2,211,640	.....	5,528,313	.....

The increase of 2,211,640 tons for August contrasts with a decrease of 1,814,808 tons in August, 1914, from August, 1913. The Duluth percentage to Sept. 1, 1915, was 34.99, against 19.51 per cent last year, while the Great Northern dock at Superior shipped 14.32 per cent of the total this year, against 33.57 per cent to Sept. 1, 1914.

The Park Drop Forge Company, Cleveland, Ohio, which has enlarged its plant considerably the past year, has just completed an extension to the main forge shop, 80 x 100 ft., and has under way a factory addition, 40 x 80 ft. It is also installing additional steam drop hammers and hydraulic presses, which, with its present machines, will give it an equipment of 46 hammers and heavy hydraulic presses, the hammers ranging up to 8000 lb. falling weight. The steel storage capacity will be doubled by an extension to the present yard. The company is operating its plant 24 hours a day and is devoting its entire output to automobile work, specializing in crank shafts and heavy axles.

Thomas J. Costello, the Costello Metal Specialties, Warren, Ohio, has been granted a patent on a new design of safety coupling box for sheet and tin mills, for which some points of superiority in regard to operation and economy are claimed.

Iron-Ore Agglomeration in Rotary Kilns*

Nodulizing Pyrite Cinder and Low-Grade Ores — Prevention of Rings in Kilns — Use of Nodules in Virginia Furnaces

BY SAMUEL E. DOAK

The utilization of rotary kilns, of the well-known cement type, for the preparation of iron ores for the blast furnace, has become of considerable economic importance within the past ten years in certain localities, notably those where the native ores are lean. Such kilns may be used simply for the agglomeration of ores too fine to be charged into the blast furnace, or for the desulphurization of lump and fine ores the sulphur content of which does not exceed 6 or 7 per cent.

The desulphurizing action can be combined with that of agglomeration provided the kiln is sufficiently large. Other processes have been developed for the same purpose, but while I am not able to draw a comparison between them by reason of lack of sufficient data, it is safe to say that the kiln, if properly dimensioned for the character of ore to be treated, will compare favorably in its results, both as to economy and quality of product, with any other process. It is not, however, as well adapted for the treatment of flue dust as is a sintering operation, on account of the large percentage of fine coke contained therein. Any combustible entering the kiln at its feed end renders the process very much more expensive and unsatisfactory on account of the difficulty of controlling the temperature, also because of the rapidity with which long "rings" form, due to the increased heat at the cooler end of the kiln.

TREATMENT OF PYRITE CINDER

The greatest value of the kiln at present is in the treatment of pyrite cinder, or the residue from pyrites ore after the extraction of the greater part of the sulphur. This cinder has too much sulphur remaining in it to be allowed to form a large part of the blast-furnace burden, without further treatment. It will range in metallic iron from 42 per cent, representing a very low-grade cinder from a domestic pyrites, to the 64 per cent of the residue from the best Spanish ore, and the corresponding silica content will vary from the maximum of about 25 per cent to 1.5 per cent. The residual sulphur depends largely on the type of burner used in the original desulphurization. In general, the leanest original ores retain the greatest amounts of sulphur. In modern practice the percentage of sulphur in the cinder is rarely as great as 6 per cent, and seldom lower than 1.50 per cent.

Average analyses for iron, silica, and sulphur of the cinders that have come under my personal observation are as follows:

	Iron, Per Cent	Silica, Per Cent	Sulphur, Per Cent
Virginia fines	48	18	4.2
Virginia lump	54	12	5.0
Spanish fines	58	8	2.5
Spanish lump	63	2	2.0

Nearly all cinders contain also zinc, copper (frequently in sufficient amounts to be extracted commercially as a by-product), calcium, magnesium, etc., and sometimes lead. The total of these accompanying elements, however, is usually well under 6 per cent.

The process is a simple roasting, with the addition in the case of fine ores of a nodulizing or agglomerating operation, performed near the discharge end of the kiln, at a higher temperature than is necessary for the desulphurization. The sulphur is combined in the ore as sulphide and sulphate of the various bases, and if the kiln is not forced over its capacity there is no dfficulty in reducing it to less than 0.05 per cent of the finished product. The principal caution to be observed in desulphurizing is not to allow the kiln to get too hot at the back end. To get a dead roast the operation should be very gradual, and the heat should range from a barely preceptible dull red at the feed end to a bright yellow at the discharge end. When the ore is too hot in the center of the kiln, there seems to be a tendency to hinder the desulphurization, probably on account of an almost imperceptible glazing of the particles of cinder, that renders them impervious. For this reason it is important that the roasting should be complete before the nodulizing begins, since for the success of the latter operation the ore should be sufficiently pasty to ball up. This pastiness, however, should never be carried to the point where there is any flow of the cinder, and in fact it should never be visible in the kiln. A bright yellow heat is sufficient for the nodulizing, and it is well to keep the zone of agglomeration as near the discharge end of the kiln as possible, 15 ft. being sufficient length for the operation in any kiln not more than 100 ft. in length. For this reason a short flame is very desirable.

HEIGHT OF THE STACK

Oxygen necessary for the desulphurization is furnished either by stack draft at the feed end, by a blower at the discharge end (in connection with the fuel supply), or by both. The height of the stack is determined more by the necessity of raising the sulphur fumes above the height where they are obnoxious to people, and harmful to vegetation, than by the oxygen requirements of the process, as the slope of the kiln together with the draft induced by the coal blower is sufficient in small kilns to furnish the required amount of air without a stack. A kiln 60 by 5 ft. was run for several months without any stack, with excellent results, the only artificial draft being supplied with the powdered coal by an Aero pulverizer. This same kiln on an 80 by 4 ft. stack gave incomplete desulphurization and an excessive amount of "ring" trouble, due to too high a temperature at the feed end.

At present the rotary kiln owes what popularity it possesses to its nodulizing feature, in spite of the fact that it is a cheap and efficient roaster, and that it is much more successful, as a roaster, working on coarse than on fine ores. As I remarked above, the sulphur should be practically eliminated from the ore before nodulizing begins. The most satisfactory way of insuring this would be to separate the two processes by using two kilns, but that would be impracticable except in a very large plant, and as a matter of fact the whole operation can be done very well in one kiln provided it is not too small. The greatest advantage of separating the process would be that "ringing" could be almost entirely eliminated in the desulphurizing kilns, and confined to the nodulizing kilns, which could be made short and of large diameter and great capacity.

DIMENSIONS AND OUTPUT OF THE KILN

It has been the custom arbitrarily to connect a certain diameter with a certain length of kiln. A 60-ft. kiln is usuall 5 ft. in diameter; 80 and 85-ft. kilns are 6 or 7 ft. in diameter, and a 100-ft. kiln is ordinarily 8 ft. in diameter, but it would frequently be more economical to proportion the kiln in a less haphazard way than by accepting the builder's standard designs. The two determining factors should be the output desired, and the quality of the ore to be roasted. The output is dependent on the dimensions of a cross-section of the bed of ore that can be carried in the kiln, the slope of the kiln, and its speed of revolution. The slope of the kiln, however, can be left out of consideration. Good practice places it at ¾ in. to the foot, and increased or decreased output can be better obtained by changing either of the other variables than by changing this.

Speed control, too, is a feature of the design of every

*From a paper to be presented at the September meeting of the American Institute of Mining Engineers in San Francisco. The author is a mining engineer, Philadelphia, Pa.

kiln now, so that this factor may be adjusted to the most satisfactory point after the kiln is in operation. The question of output, then, so far as the kiln design is concerned, is determined by the width and depth of the ore bed. In general, the latter can be increased with the length of the kiln, since the length of time it takes the ore to pass through the kiln will be greater as the kiln grows longer, all other things being equal, but the increased capacity due to the length will not be very great, since, without changing the diameter, the ore bed cannot be deepened to any great extent without harming the roasting process, for which a continual and complete stirring and overturning of the ore bed is necessary. Too great a depth of bed prevents this.

An increase in the diameter of the kiln increases the possibilities of the output considerably, by allowing the cross-section to be made much greater with a slight increase in depth, giving the desired effect of a greater ratio of surface of ore exposed to the air in comparison with the area of the cross-section. It would seem reasonable, then, to base the length of the kiln entirely upon the time necessary for desulphurization and agglomeration, and to control the output by the diameter.

The question of the speed of progression of the ore in the kiln, upon which, together with the kiln length, depends the time available for treatment, cannot be accurately determined beforehand, as it is controlled by too many variables. The size of the ore particles, and their shape, the depth of bed, condition of the lining, and the size and shape of the ring all have an effect on the speed of progression of the charge. Fortunately, however, we know from actual practice that any type of cinder can be treated satisfactorily in kilns 80 to 100 ft. in length, turning at a speed of from one revolution in 60 seconds to one in 90 seconds. The greater length is safer in treating all fine, high-sulphur cinders, since it reduces greatly the chances of a poor product through careless supervision.

TONNAGE OUTPUT AND FUEL CONSUMPTION

The tonnage output of a kiln varies greatly with the kind of cinder charged. A kiln 60 by 5 ft. with 4½-in. lining will treat 1500 tons a month of low-sulphur lump ore, while on high-sulphur fines, it will with difficulty take care of 750 tons, and frequently even at this low tonnage a large percentage of the product will not be nodulized. A kiln 85 by 7 ft. will handle 3000 tons of high-grade cinder per month, and about 1500 tons of the poorest grades, while a kiln 100 by 8 ft. will vary from 4500 to 2500 tons with the quality of the cinder treated. A kiln 85 by 8 ft. should handle almost as much as the one 100 ft. long, but at a greater fuel cost. In general, the larger kiln will have the lower fuel cost and the fine domestic ores will need less coal, on account of their higher sulphur content. On a 60 by 5 ft. kiln, the fuel consumption averaged for several months about 12 per cent by weight of the weight of roasted ore.

The mechanical difficulties that were so common when rotary kilns were first used for the treatment of iron ores have been practically eliminated. The most important things to be observed to insure continuous operation are, to make the kiln sufficiently strong (reinforcing it especially very heavily under the tires), and to keep the operating machinery well protected from the dust. The tires should always be kept tight to the shell, as if any play is allowed the bolt holes will gradually become enlarged, and the kiln will bear down hill so strongly that it will frequently break its thrust bearings. At least an inch of additional metal should be put around the shell under the tire.

The one great obstacle now in the way of continuous operation is the formation of "rings" caused by the cinder becoming hot enough to stick to the lining. As soon as the lining is covered the "ring" increases more rapidly by building up upon itself around an ever-decreasing circumference until it seriously interferes with the operation, and has to be removed. It usually forms in the 15 or 20 ft. nearest the discharge end of the kiln, and puts an excessive amount of weight upon that end. A piece of the "ring" is hard and has the appearance of having been partly fused. It looks very much like mill cinder.

PREVENTION OF RINGS

Many devices have been tried to prevent the formation of the "ring," or to remove it without stopping the kiln, but, so far as I know, none of them have been successful. The best plan, in my experience, has been to shut down the kiln, when the ring became too large, cool it off with water, and cut it out with bars and picks. It is impossible, I feel sure, to prevent its formation when running on fine ores. With low-sulphur lump ores that do not need to be nodulized, careful control of the heat will allow a run of indefinite length, but as all the lump cinders (unless screened) carry a considerable percentage of fines (—20 mesh), sooner or later a shutdown will be necessary. On any kind of cinder, however, the formation of the ring can be postponed by keeping, as nearly as possible, the conditions of temperature, speed, and feed, from fluctuating. The temperature should always be kept as low as is compatible with the successful operation of the kiln.

A 9-in. firebrick is generally used for lining, and is probably the best size on the larger kilns. A 4½-in. brick is satisfactory for kilns of 5 and 6 ft. diameter. The thicker bricks protect the shell better and prevent warping, but in the smaller kilns they reduce the available diameter too much. The lining wears down rapidly, and frequently individual bricks are loosened or broken in cutting out the ring. If the shell becomes warped under the tires, as is frequently the case when the kiln is not reinforced strongly enough at this point, it is very difficult to keep the bricks in. A 9½-in. lining should last over a year in the hot part of the kiln where the ring forms, and very much longer in the cooler end.

Automatic feeders are frequently used to insure a constant rate of charging, but they are really unnecessary, as the slow motion of the kiln will effect this, if only a simple feed pipe is used. All machinery used in handling the ore and the fuel and in rotating the kiln should be as nearly dust proof as possible, and should be driven by fully inclosed motors, as the fine cinder dust is very harmful. The best plan is to keep the feeding apparatus, the machinery for handling the roasted ore, and the fuel pulverizer and blower, all under separate housings. The kiln itself does not need to be housed, except where such housing is necessary to protect its driving machinery.

Powdered coal is used as the fuel, so far as I know, exclusively, with the exception of one or two plants where blast-furnace gas has been tried. An oil flame would probably be very satisfactory where cheap oil could be obtained, on account of the ease of controlling the temperature incident to its use.

COST OF PRODUCTION

The cost of production of a ton of roasted ore, aside from the cost of the raw cinder, depends chiefly on the labor cost. Two men on a shift should be able to take care of a well-designed plant producing up to 100 tons in 24 hr., while in a poorly designed plant this number might easily reach four or five. On a small kiln 5 by 60 ft., the labor cost per ton, on high-sulphur fine cinder, averaged 40c. for several months, and with the same kiln, using high grade lump cinder, this figure was reduced to 30c., but both these figures were excessive on account of faulty design, that made necessary three and four men on a shift; also on account of a very low output per man, due to the small size of the kiln. On the other hand, this was partly balanced by the fact that wages were low, and only two shifts were necessary. Repairs and supplies should not cost over 8c. per ton of roasted ore on a kiln of any size. The important factor in economic kiln operation is careful designing, and it cannot be said too strongly that the cost of operation of a rotary kiln will be almost entirely determined by the layout of the plant.

USE OF THIS PRODUCT IN SOUTHERN FURNACES

The roasted ore, for which the cement term of clinker is used, works very well in the furnace. In Virginia practice, where the blast pressure is com-

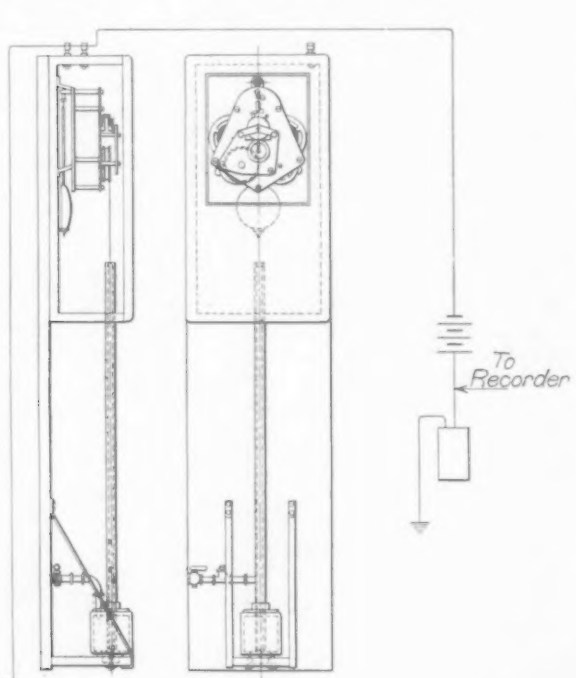
paratively low, it is not essential that the nodules should be large. If 80 per cent of the clinker stays on a screen of ⅛-in. mesh, there will be no difficulty in the furnace at pressure of under 9 or 10 lb. It is very easy to make larger nodules, but as a higher temperature is required to do so, with the attendant evils of more frequent "ringing," greater fuel expenses and a harder, less porous product, it is better to keep the nodules as small as possible. The clinker frequently forms from one-sixteenth to one-half of the burden without ill effects, working with "brown ore" and specular hematites, and by its use the yield of the Southern furnaces where the native ores are lean can be raised from a scant 42 per cent to 50 per cent and over, depending on the quality of the cinder.

It is in localities where the native ore is lean that the kiln is valuable. It affords an opportunity of enriching the burden with a high-grade ore at a much lower cost than could be done by direct purchase of lake or other rich ores, and where the silica in the native ore averages well over 20 per cent, it is indispensable that the burden should be sweetened in some way to cut down the excessive amount of flux and consequent fuel necessary to produce good iron.

Water Level Indicator for Tanks

A water level indicator that does not employ a float on an exposed water surface has been placed on the market by Robert M. Kellogg, Ridgewood, N. J. This apparatus indicates and records the height of water in a reservoir, standpipe or tank and may transmit the record to any distance over an electric wire. The elimination of the float on the water surface, it is emphasized, does away with the danger of freezing. If a record is not required the device can be used as an indicating apparatus to enable the engineer to determine the height of water at any time.

The apparatus consists of a transmitter at the standpipe and a recorder in the engine room or office, the connection between the two being made by a single iron or copper wire. The distance between the instruments does not matter, it being emphasized that the apparatus may be operated over any distance that can be covered by a telegraph line. Only a few dry batteries are required for operation and the electrical features are simple.



A Device for Indicating the Level of Water in Tanks, Standpipes, Etc., That Uses a Mercury Column to Balance the Pressure

The general arrangement of the indicator with the exception of the recording mechanism is shown in the accompanying drawing. A mercury column is employed to balance the water pressure which is admitted to the transmitter through a set of fittings. The changes in the level of the water cause the mercury column to rise or fall proportionately and move a float up or down. This float is carried on a flexible cord wrapped around a drum and kept taut at all times. The drum is geared to a float contact which assumes a position corresponding to the height of water. A revolving crank with a contact point at the end is operated by clockwork once every 4 min. This contact point engages the zero contact at the beginning of each revolution and during some portion of the time required for a complete cycle engages the float contact, the time elapsing between the making of the contacts varying with the height of the water.

Where only indications of the water level are required a telegraph sounder is installed, adjacent to the supply pump, and dash-dot signals transmitted to it, the time interval between the dash signal corresponding to the zero contact and the dot signal corresponding to the float contact indicating the height of the water. The recording instrument not only indicates every 4 min. but makes a permanent record of the height of the water. It consists of a clock movement automatically kept in time with the transmitter and operating a 24-hr. dial with a recording pen. Normally the pen is kept away from the chart and sweeps across the dial from zero to the maximum as the transmitter crank revolves. When the circuit is made between the transmitter crank and the float contact, the pen is drawn against the chart by a magnet in the recorder and makes a dot, the series of these being so close together as to form a practically continuous line.

Six standard sizes of indicators are made for variations in height, ranging from 10 to 80 ft., and if desired can be furnished in special sizes to record any height up to 300 ft.

Canadian Lignite Investigation

Lignite obtained from the Province of Alberta, Canada, has been under investigation by the Department of Mines of Canada and a report of over 100 pages has been issued covering the results. This report, which is made by B. F. Haanel, chief of the Fuels and Fuel Testing Division of the department, and John Blizard, states that in an extended number of trials in gas producers the fuel was found eminently suited for such gas production. In fact it is suggested that the nitrogen content is sufficiently high to make recovery of ammonia or ammonium sulphate profitable. It is added that no trouble was experienced in utilizing the gas in a gas engine. The tests cover also the use of the lignite under steam boilers, and it was concluded that lignites with a moisture content up to 30 per cent do not materially affect boiler efficiency. It is explained that fuels of this class require a specially large combustion chamber and a brick ignition arch arranged to burn the large percentage of volatile matter contained.

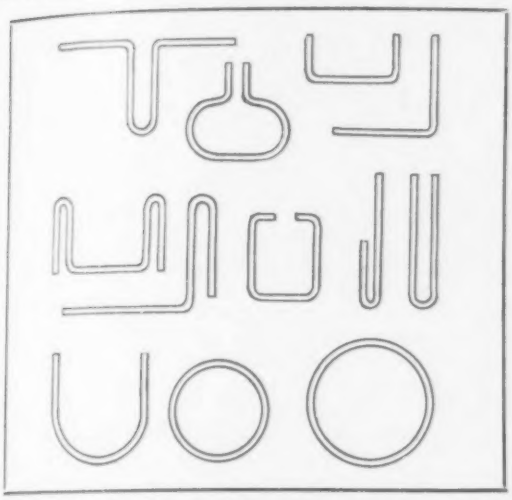
Russia's Progress in Iron and Steel

Russia's decided progress in the iron and steel industry is shown in the following table of output of pig iron, finished and semi-finished steel in metric tons, as given by *Engineering*, London, for the last six years:

	Pig Iron	Finished Steel	Semi-finished Steel
1914.....	5,207,000	4,617,000	4,594,000
1913.....	4,756,000	4,224,000	5,111,000
1912.....	4,111,000	3,676,000	4,433,000
1911.....	3,630,000	3,272,000	3,885,000
1910.....	2,999,000	2,965,000	3,482,000
1909.....	2,821,000	2,628,000	3,079,000

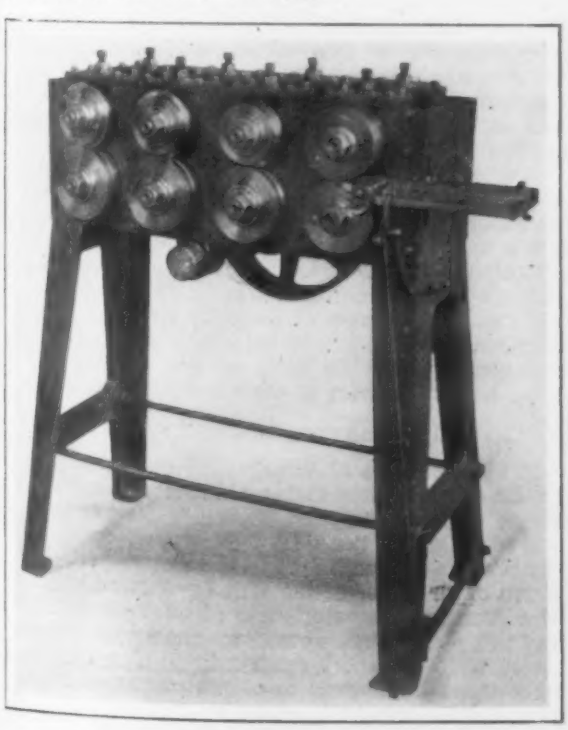
A New Sheet Metal Forming Machine

A new design of rolling machine for forming strip sheet metal into various shapes has been developed by C. L. Frost & Son, Grand Rapids, Mich. The capacity of this machine is from 4000 to 4500 ft. of strip sheet metal per hour and some idea of the shapes in which it is turned out is presented in the accompanying drawing.



Some of the Various Forms into Which Strip Sheet Metal Is Rolled by the Machine

The machine occupies a floor space of only 32 x 48 in. and the forming rolls, which have independent adjustments, are 5 in. in diameter. In operation the coil of material to be formed is placed on a reel at the end of the machine, one end being straightened sufficiently to reach into the machine and be gripped in the first pair of rolls. This draws the material into the machine forcing it between the other rolls which are driven by gears. The adjustments provided for the various rolls enable the different thicknesses of metal to be accommodated as well as providing for a variation in the finished forms.



A New Rolling Machine That Has Been Developed for Turning Out Various Shapes of Strip Sheet Metal

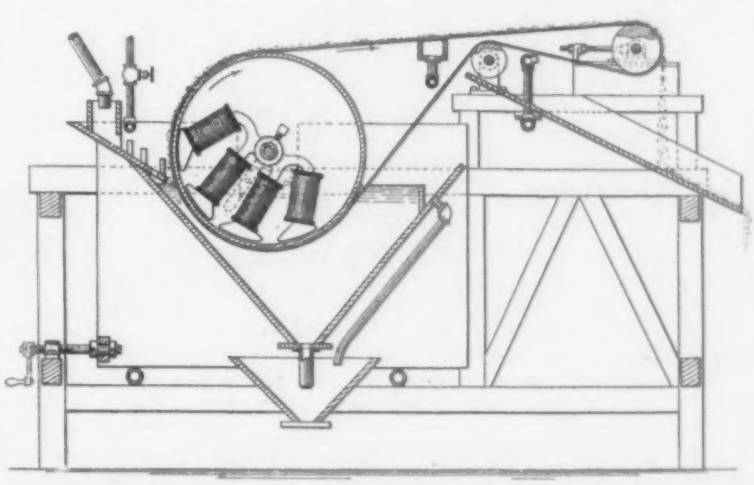
The machine is belt driven, the driving pulley being partly visible below the machine at the back. From the shaft on which this driving pulley is mounted the power is transmitted through gears to the various rolls.

A New Magnetic Iron-Ore Separator

An improved method of magnetic separation for iron ore is the subject of a patent (U. S. 1,146,140—July 13, 1915) issued to Francis B. Dutton and Benjamin E. McKechnie of Lebanon, Pa., and assigned to the Pennsylvania Steel Company.

Magnetic iron ore, after crushing and suspension in water, is brought gradually into the field of a number of magnets of substantially the same strength beneath the surface of the carrying liquid. The removal is effected in a direction the reverse of that in which the crushed ore approaches the magnetic field. The separated ore is also somewhat dried before being delivered from the separator.

The illustration, a vertical cross-section, shows a tank to which the crushed or powdered ore, suspended in water, is supplied. A rotating watertight drum of non-magnetic material is partly immersed in the liquid, and in this drum are mounted several stationary magnets. The carrier for removing the separated ore may be an endless belt of canvass or fine mesh wire, encircling the drum and leading to a suitable depository for the concentrates. The side walls of the tank, at the end where the crushed ore, suspended in the carrying liquid, is admitted, slope toward the drum so that the ore to be treated is brought gradually within the influence of the magnets so that, as the richer particles are first separated from the impurities, they may be removed by the carrier. The impurities or sludge settle in the tank and are drawn off.



An Apparatus for the Magnetic Separation of Ores While Submerged under a Carrying Liquid

That the concentrates may be delivered in as dry a condition as practicable, the belt is somewhat longer than necessary. To insure more efficient drying a suction apparatus is located under the belt at a suitable point, connected with a suction pump, so that as the concentrates pass along on the belt a large part of the moisture may be removed.

A rough and worn commutator will always produce sparking and thus not only cause annoyance and low efficiency during operation but eventually make an extended and expensive shutdown for necessary repairs. It has been found that graphite brushes are excellent for use on commutators, being free from grit and self-lubricating. Many users of electric power machinery have adopted Dixon's graphite brushes, and it is stated that they have been found highly satisfactory.

The Coming Program for Army and Navy

The Two Budgets May Carry $470,000,000—Navy Department Making a Canvass of Manufacturing Plants

WASHINGTON, D. C., Sept. 7, 1915.—The Administration is rapidly whipping into shape the plan of military preparedness that will be submitted to Congress at the coming session. The project as a whole will shortly have consideration at a conference to be held at the White House, the President's conferees being Secretary of War Garrison, Secretary of the Navy Daniels, Senator Tillman, chairman of the Senate Committee on Naval Affairs; Senator Chamberlain, chairman of the Senate Committee on Military Affairs; Representative Hay, chairman of the House Committee on Military Affairs, and Representative Padgett, chairman of the House Committee on Naval Affairs. Admiral Benson, chief of operations, and other Navy and War Department officers will attend to give the benefit of their expert advice.

The publication, by the President's authority, of the letters addressed by him to the Secretaries of War and the Navy discloses the interesting fact that he contemplates a larger and more comprehensive program than, in his opinion, Congress may be willing to authorize at the coming session. It is also significant that the relief of the tension in this country's relations with Germany has encouraged the opponents of a liberal policy for the national defense to urge the lack of necessity for any great expenditure of money for the increase of the army and navy on the ground that the United States, having passed a great crisis, need never fear that it will become involved in an important foreign war. The advocates of preparedness, however, will argue that the satisfactory outcome of the incidents referred to would have been much more fully guaranteed if the United States had been known to be in position to enforce its demands.

It may now be stated upon excellent authority that the additional appropriations necessary to carry out the plans of the War and Navy Departments will approximate $150,000,000, with a possibility that the amount may be increased to $200,000,000. At the last session Congress allowed about $130,000,000 for the War Department and approximately $140,000,000 for the navy, a total of $270,000,000. If present plans are carried out the naval and war budgets this year will carry in round numbers at least $470,000,000, and possibly more in the event that Treasury conditions show an improvement.

LARGE OUTLAY FOR THE NAVY

If Congress follows the guidance of the President and his advisers the major portion of the increased allowance for war purposes will be expended on the navy. In view of the lessons taught by the European war, Administration leaders are convinced that it is the duty of the Government to adopt a progressive policy in upbuilding the navy as a means of assuring the creation of a marine force equal, ship for ship and man for man, to that maintained by any other power and in size second only to that of Great Britain. They are convinced that the country will insist upon big naval bills in the future, but they also are satisfied that the country will not countenance any program for the establishment of a mammoth regular army. It is the understanding that the Administration will urge an authorization increasing the regular army from 100,000 to 200,000 men. It will also ask for appropriations to strengthen the coast defenses and for the purchase of modern equipment, such as aircraft, armored automobiles and other apparatus in which the American military establishment is deficient. Some method of creating a reserve to supplement the forces of the regular army in time of war will be presented for consideration by Congress.

The Administration's policy of preparedness, contemplating the expenditure of larger sums on the navy than on the army, is based on possible need should an enemy attempt to invade the United States. Accordingly, it is regarded as highly important that chief consideration shall be given at the outset to adequate upbuilding of the first line of defense, namely, the navy. Experts have advised the President that if the United States possessed a navy as strong as that of Great Britain it would be practically impossible for an enemy to land a force on either coast. The Administration will try to solve the problem of providing trained men for the army against the time of need by some plan of diffusing military education through the various colleges, public schools, and other institutions of learning throughout the United States, financial aid to be extended by the Federal Government.

REVENUE RAISING WITHOUT TARIFF REVISION

Secretary of the Treasury McAdoo recently announced that under no circumstances would the Government issue bonds to obtain funds for the proposed military program. He made it known officially, for the first time, that the Administration would ask Congress to extend the life of the emergency war revenue act, which will expire by limitation on Dec. 31 next. This was long ago foreshadowed in this correspondence. Secretary McAdoo refuses to concede the probability that the Administration may be forced to recommend the restoration of the sugar duty and a further partial revision of the tariff as a means of gaining sufficient revenue. Nevertheless, there can be no doubt that in due season the Administration will be obliged to announce that the treasury exigency makes it necessary to ask for a modification of the revenue laws.

The President has decided to use every endeavor to persuade Congress to cut at least $100,000,000 from the appropriation bills other than those that carry supplies for the army and the navy. The estimates that will be submitted to Congress will be reduced accordingly, or at least Administration leaders say they will be reduced. Doubts are expressed that their hopes in this regard will be realized. The unsatisfactory condition of the treasury is the cause of the greatest concern on the part of those who would build up the army and the navy. They look to President Wilson to effect economies and to urge such changes in the revenue laws as will make up the difference between outgo and income.

A good deal of significance is attached to a statement made by Chairman Tillman of the Senate Naval Committee following a discussion of the national defenses with President Wilson at the White House. Heretofore Senator Tillman has bitterly opposed increased appropriations for the navy, but he has recently announced that in view of present world conditions the American policy should be changed and that the navy particularly should be built up and equipped on a parity with the navies of other first-class powers.

WHO CAN MANUFACTURE FOR THE NAVY?

For the purpose of securing information as to the possible output of materials which the navy might need in case of an emergency, Secretary Daniels has decided to follow the example of Secretary Garrison, who a month ago authorized General Crozier, chief of the Bureau of Ordnance of the War Department, to circularize American manufacturers of war material. The schedules, drawings, etc., prepared by General Crozier were published exclusively in THE IRON AGE at the time. According to official announcement, the inquiry of the Navy Department pertains primarily to the manufacture or output of structural materials used in the building of ships, boats, etc., and in the manu-

facture of various articles of ship and boat equipment, raw materials for the production of clothing, provisions, etc. As in the case of the inquiries sent out by General Crozier, the replies will be treated as confidential and will be recorded for reference from time to time as the work of preparation proceeds. In explanation of the department's plans, Assistant Secretary Roosevelt says:

While this is a peace-time procedure, pure and simple, the demands from abroad for various articles have so taxed the facilities of home manufacturers as to make it difficult to obtain certain classes of articles. In the case of some materials such as acids, dyes, etc., the local supply is short because of the reduced importations, and in some cases it has been necessary to comb the market, as it were, in order to find some of the things wanted.

Fortunately this condition applies to only a few items which so far the navy has been able to obtain, and at favorable prices, but it has been noticed that recently long-term deliveries are being quoted in tenders for rolled and sheet materials.

It is hoped that by means of the circulars which have been issued the Navy Department will be able to keep in closer touch with industrial conditions as they exist throughout the United States. Furthermore, the facilities of various manufacturers for turning out munitions of war have been so increased that it is desired to know what the increased output may be. The inquiries will cover a wide field, such as the facilities of transportation lines, principally by sea; the supply of fuel and the output of supplies and materials of many descriptions.

The announcement just made at the Navy Department that plans have been completed for the creation of a naval reserve to be composed of 50,000 men shows in a striking manner that Secretary Daniels has experienced a change of heart. Until quite recently the Secretary of the Navy has looked with disapproval on the agitation for more adequate preparedness. He has now fallen in line with the "agitators," and while he will not go as far as Colonel Roosevelt and some others would have him he is committed to a policy of materially enlarging the navy both as to ships and men. The naval reserve proposed will be supplemental to the naval militia bodies maintained by the States in conjunction with the Federal Government. W. L. C.

Special Machinery Days at Exposition

Exhibitors in the Machinery Palace at the Panama-Pacific International Exposition have set apart two special days for making a special effort to interest visitors to the exposition at the time of the International Engineering Congress. The internal combustion engine exhibitors have chosen Sept. 22 as Internal Combustion Engine Day, and Machinery Palace exhibitors as a whole have set aside Sept. 25, at the end of the week of the Congress, as Machinery Day.

On Internal Combustion Engine Day there are to be special demonstrations of the engines in the afternoon, after the reading of papers on the general subject in the morning before the Congress. An effort is being made, in connection with Machinery Day, to get manufacturing shops, technical schools, machinery firms and others within easy reach of the exposition to close their places of business and give all an opportunity to visit the exposition on that day. The Machinery Exhibitors' Association, formed of exhibitors in the Palace of Machinery, has taken charge of arrangements for Machinery Day and is raising a special fund to help in making the day conspicuous, supplementing special efforts which the Exposition Company has promised also to make.

A screw driver having the handle entirely covered by rubber has been brought out by H. D. Smith & Co., Plantsville, Conn. It is designed particularly for use in working around electric fixtures. The rubber covering extends continuously over the handle and there is no shoulder or obstruction where it and the metal blade meet. This, it is emphasized, enables the screw driver to be used readily at all times and particularly in out of the way places, while the rubber covering, besides providing a guard against electrical shocks, gives a comfortable grip for the hand.

Setting Device for Inserted Tooth Saws

To enable the teeth of inserted tooth saw blades to be set accurately to the proper height and thus all do their proportionate share of the work, the Hunter Saw & Machine Company, Fifty-seventh and Butler Streets, Pittsburgh, Pa., has placed a special device on the market. It has a cast-iron base into which is fitted a cold-rolled steel bar. A graduated indicator slides up and down along the bar and is adjusted to permit blades up to a maximum diameter of 76 in. to be assembled rapidly and correctly. In connection with the device the proper size of arbor is furnished to fit blades from 12 to 76 in. in diameter.

A Device for Setting the Teeth in Inserted Tooth Saw Blades at a Uniform Height

Accuracy in the setting is taken out of the hands of the mechanic and left to indicator at the top of the blade, which indicator registers to 0.001 in.

Tennessee Educational Extension Scheme

Educational extension work in mechanical or industrial lines is to be conducted this fall in Tennessee by the Tennessee Manufacturers' Association and the University of Tennessee jointly. M. E. Temple, secretary-treasurer, Chattanooga Furniture Company, and former president of the Chattanooga Manufacturers' Association, is chairman of the educational committee of the State association. He says that the branches to be taught and become a part of the extension work have not yet been entirely decided upon, but the following groups will compose the first-year course: 1. Mechanical engineering, which will embrace mathematics, mechanical drawing, machine designing, steam engine and boiler and elementary mechanics. 2. Electrical engineering, which will embrace mathematics, electrical engineering, mechanical drawing, machine designing, steam engine and boiler. 3. Reinforced concrete, which will embrace reinforced concrete designing, strength of materials, elementary mechanics, mechanical designing and mathematics. It will be the object of the Tennessee Manufacturers' Association to prevail upon at least twenty employed men in each of the manufacturing towns of the State to give a few hours each week to this educational work.

The Silesian (Germany) coke production in May, 1915, reached high-water mark at 1,788,000 metric tons, an increase of 9 per cent over the preceding month and of 3 per cent over May, 1914. Exports in May were 161,000 tons against 141,000 tons in April. The average monthly exports in normal times are about 450,000 tons. Coke demand now is just about equal to the supply, due to the reduced quantity of coal mined and to the larger use of coke by railroads and manufacturing plants in substitution for or supplementing coal. This larger use of coke is due, of course, primarily to the necessity of a very full operation of by-product ovens as an adjunct to the manufacture of explosives for munitions. Individual consumers have to be satisfied after large government contracts have been filled.

Program of American Foundrymen's Association Meeting

The American Foundrymen's Association, which will hold its annual meeting this year at Atlantic City, N. J., Sept. 28 to Oct. 1, has selected the Hotel Traymore for convention headquarters, while the different professional sessions will be held in the convention hall of Young's Million Dollar Pier, where there will be the exhibits conducted under the auspices of the Foundry & Machine Exhibition Company. The program of the meeting is as follows:

Monday, Sept. 27, 8 P. M.

Informal dance, Young's Million Dollar Pier.

Tuesday, Sept. 28, 10 A. M.

Joint opening session, American Foundrymen's Association and American Institute of Metals.

Address of welcome and response.

Report of A. F. A. Committee on Safety, by A. W. Gregg, chairman, Bucyrus Company, South Milwaukee, Wis.

"Tests of Lenses for Foundry Goggles," by F. W. King, Julius King Optical Company, New York. This address will be accompanied by demonstrations.

Report of A. F. A. Committee on Industrial Education, by Frank M. Leavitt, chairman, University of Chicago, Chicago.

"Functions of Sand Binders," by Henry M. Lane, consulting foundry engineer, Trussed Concrete Building, Detroit.

"Notes on Applications and Characteristics of Cores in Modern Molding," by R. A. Bull, Commonwealth Steel Company, Granite City, Ill.

"Molding Sands," by C. P. Karr, associate physicist, Bureau of Standards, Washington, D. C.

Tuesday, Sept. 28, 2.30 P. M.

Report of A. F. A. Committee on Specifications for Foundry Scrap, by S. D. Sleeth, chairman, Westinghouse Air Brake Company, Wilmerding, Pa.

"Patternmaking for Molding Machine Work," by E. I. Chase, Cadillac Motor Car Company, Detroit.

"Foundations for Jar-Ramming Molding Machines," by E. S. Carman, Osborn Mfg. Company, Cleveland.

"The History and Development of the Molding Machine with Sidelights on Latter-Day Practice," by J. J. Wilson, Cadillac Motor Car Company, Detroit, and A. O. Backert, Penton Publishing Company, Cleveland.

"Scientific Management and Its Relation to the Foundry Industry," by H. K. Hathaway, Tabor Mfg. Company, Philadelphia.

"Reclaiming Molding Sand," by W. M. Saunders and H. B. Hanley, Saunders & Franklin, analytical and consulting chemists, Providence, R. I.

"The Relation of the Foundry Foreman to His Employer," by S. V. Blair, Rushville, Ind.

Tuesday, Sept. 28, 8 P. M.

Theater party for members and ladies of the American Foundrymen's Association and the American Institute of Metals.

Wednesday, Sept. 29, 10 A. M.

"The Modern Foundry Advance," by Dr. Richard Moldenke, consulting metallurgical engineer, Watchung, N. J.

"Manufacture, Constituents and Essentials in the Purchase of Pig Iron for Foundry Use," by Oliver J. Abell, THE IRON AGE, Chicago.

Report of the A. F. A. Committee on Costs, by B. D. Fuller, chairman, Westinghouse Electric & Mfg. Company, Cleveland.

"Organization in the Foundry of the University of Illinois Shop Laboratories," by R. E. Kennedy and J. H. Hogue, instructors, University of Illinois, Urbana, Ill.

"The Structural or Mechanical Theory of the Effect of Rust on Cast Iron and Wrought Iron or Steel," by R. C. McWane, publisher of *The Fire Engineer*, and Harry Y. Carson, Central Foundry Company, New York.

Wednesday, Sept. 29, 2.30 P. M.

"Pouring Systems for Gray Iron Foundries," by H. Cole Estep, associate editor, *The Foundry*, Cleveland.

"Fuel Oil Cupolas," by Bradley Stoughton, consulting metallurgical engineer, New York City.

"Inspection of Automobile Castings," by C. B. Wilson, Wilson Foundry & Machine Company, Pontiac, Mich.

"Common Defects in Gray Iron Castings—Their Causes and Remedies Therefor," by Herbert M. Ramp, Elmwood Castings Company, Cincinnati.

Report of A. F. A. Committee on Specifications for Gray Iron Castings, by W. D. Putnam, chairman, Detroit Testing Laboratory, Detroit.

Report of A. F. A. Committee on Standard Methods for Analyzing Coke, by H. E. Diller, chairman, General Electric Company, Erie, Pa.

Wednesday, Sept. 29, 8 P. M.

Annual business session, Banquet room, Hotel Traymore.

Annual address of the president, R. A. Bull, Commonwealth Steel Company, Granite City, Ill.

Report of the secretary-treasurer, A. O. Backert, Cleveland.

Report of the auditor.

Report of the nominating committee.

Election of officers.

Miscellaneous business.

Thursday, Sept. 30, 10 A. M. and 2.30 P. M.

Steel Sessions.

"Dynamic Properties of Steel Employed in the Manufacture of Castings of Various Types," by J. Lloyd Uhler, Union Steel Casting Company, Pittsburgh, Pa.

"The Particular Application of the Converter in the Manufacture of Steel Castings," by C. S. Koch, Fort Pitt Steel Casting Company, McKeesport, Pa.

"Notes on Electric Furnace Construction and Operation in the Steel Foundry," by James H. Gray, United States Steel Corporation, New York City.

"Open-Hearth Furnace Checker Design," by W. A. Janssen, Bettendorf Company, Davenport, Iowa.

"Causes of Shrinkage Cracks in Steel Castings," by William R. Bossinger, Marion Steam Shovel Company, Marion, Ohio.

Report of A. F. A. Committee on Specifications for Steel Castings, by W. C. Hamilton, chairman, American Steel Foundries, Granite City, Ill.

Report of A. F. A. Committee on Steel Foundry Standards, by Dudley Shoemaker, chairman, American Steel Foundries, Indiana Harbor, Ind., and R. A. Bull, Commonwealth Steel Company, Granite City, Ill.

"Notes on Arc Welding," by Robert Kinkead, Lincoln Electric Company, Cleveland.

Thursday, Sept. 30, 10 A. M. and 2.30 P. M.

Malleable Sessions, Annex to Convention Hall.

"Some Remarks Regarding the Permissible Phosphorus Limit in Malleable Iron Castings," by Prof. Enrique Touceda, Renssalaer Polytechnic Institute, Albany, N. Y.

"Standardization of Air Furnace Practice," by A. L. Pollard, Johnston Harvester Company, Batavia, N. Y.

"An Outline to Illustrate the Interdependent Relationship of the Variable Factors in Malleable Iron Practice," by L. E. Gilmore, Baltimore Malleable & Steel Company, Baltimore.

Paper on "Malleable Practice," by J. P. Pero and J. C. Nulsen, Missouri Malleable Iron Company, East St. Louis, Ill.

"Coal—Its Origin and Use in the Air Furnace," by F. Van O'Linda, Consolidation Coal Company, Chicago.

Thursday, Sept. 30, 7 P. M.

Annual banquet, Hotel Traymore.

Friday, Oct. 1, 10 A. M.

Introduction of new officers, reports on resolutions and other business.

Removing Rust With Chemicals

In a paper before the last annual meeting of the Iron and Steel Institute in London on the "Removal of Rust by Means of Chemical Reagents," J. Newton Friend and C. W. Marshall pointed out that in many cases, as in cleaning structural steel work prior to painting, the loss of a little iron along with the rust is not serious. In cleaning museum specimens, it is important to lose as little iron as possible, while in scientific investigations it is essential that the loss of unoxidized metal be reduced to the absolute minimum. Scraping with knives and polishing with sand or emery paper is very disagreeable and fatiguing. In the literature on the subject different investigators have frequently alluded to dilute solutions of sodium citrate as suitable media for loosening rust without dissolving any iron. The authors' experiments show, however, that these solutions are not suitable media for investigations involving the quantitative removal of rust. They are also extremely slow in their action, as shown by curves given in the paper. Various other chemical reagents were tried but none of them proved as useful as boric acid, and it did not appear possible to find a reagent that would remove rust quantitatively without also dissolving some of the iron.

The American Can Company states that it will not remove its general offices from their present location at 447 West Fourteenth Street, New York. While it has leased an entire floor in the new Equitable Building, 120 Broadway, New York, the offices to be maintained there will be used for certain specific purposes which will not in any way affect the general sales department.

COURTESY IN TIMEKEEPING*

The Duties and Relations of Timekeepers as Between Employer and Employee

Every concern must have a timekeeper. The man in this position wields more power than you think. He is intrusted with the handling of the most valuable asset of the workmen—their earnings, and the greatest liability of the company—its payroll.

But the timekeeper is more than the guardian of the payroll. In the performance of his duties he sometimes comes more frequently in contact with all the men than many of the foremen. He comes to act as a conductor of that intangible something that stands for the relations between the men and the company; in other words, the spirit of things. He can do as much or more than any man to bind the company and the men together with bonds of good-will or he can help to build a dividing wall of prejudice and harsh opinion.

HELPING THE PRODUCER TO PRODUCE MORE

We have not known for always that the timekeepers had such power, and some concerns, and thousands of men, are yet to be converted to full cognizance of it. That our company and others abreast of the times recognize the power possessed by the timekeepers is due to the knowledge that in every business relation there is a vital human element. They know you can't destroy this human element in a man. Also that he does not do his best when his human side is dwarfed, and when the value of his labor is measured only by the amount of his product. For a long time we looked at what a man produced and if we didn't like it we simply said he must do more. Now we approach the subject from the other side, and study what is necessary to enable him to produce more. That means a lot as contentment with home, working conditions, future progress, etc. Out of the study of this side of the question we have learned a lot of things. One of them is the fact that certain men, such as timekeepers, foremen, etc., are peculiarly the representatives of the company in their relations to the men. They are the gears which transmit the guiding power to the machinery of organization.

There are just two kinds of timekeepers, the curt one and the courteous one. Both may be honest and above reproach as to moral character. But one will be worth far more to the concern who employs him because he has an asset that is worth more than absolute correctness in his work—the attribute of courtesy.

I have seen enough to know that we have made great progress in the last six or seven years in the way of fairer treatment of the men at the time-office window. Most of you have seen too many men unkindly treated when they came asking questions about their time. It used to be true that a timekeeper was hired solely because of his ability to keep a payroll and I have seen the day when it was hard to find a timekeeper who could truthfully be said to practise courtesy when he was on the job. He might have done it at home.

TREATMENT OF NEGRO WORKMEN

Tennessee Company timekeepers have to deal with the negro more than any other class. They come to the check window in many cases every day. The timekeeper to them is the "check issuer." Do all you chief clerks really know how your timekeepers treat the negro?

In Alabama, Tennessee and other Southern States our iniquitous fee system feeds richly on the very life blood of the negro. Loan sharks pursue and ensnare him. Being ignorant he is easy prey. The toll unlawfully taken from the negro builds and supports many palatial homes.

I have known personally many negroes digging coal as convicts over a period of several months to work out court costs at 30 cents a day as the result of being convicted for gaming, or shooting craps with the emissary of some so-called officer in order that arrests could be made and fees ensue. I could tell you, too, why they could not work out such costs at a higher rate per day, but that is another story. These negroes wanted to be at work as free men in the mine or on the farm. It is good to know that our own company refused to be a party to such terrible economic waste and mistreatment of men and so parted company forever with the present convict system of Alabama. It was a step in line with safety first, welfare of employees, and with our present subject which is, after all, nothing more than fair and considerate treatment of men.

There may be people, I believe there are, who think that it spoils a negro to treat him kindly. I don't think so. I know they are smarter than some people give them credit for being and will learn to take all they can get. I know they can be spoiled all too easily if care is not taken. But there isn't any doubt that they can stand a smile or a kindly word just as well as we can. In fact, I've often thought that what a good many people call "talking back" on the part of the negro is only his effort to present his side of the case.

I have tried to draw the case of the negro more strongly than any other race because he is the dominant factor with whom our timekeepers must deal. But we must teach our timekeepers to treat all men courteously. When we consider them as a race we do not believe a negro is, or can be, as good as the white man. We know the white man is the superior and dominant race. It is because of this that I want to drive home the fact that this is the reason we should treat those of the inferior race fairly, kindly and even courteously. The timekeeper is the representative of the company's policies and if he does not transmit them properly he is vitiating the desire of the management to treat men right as far as in their power lies.

*From an address made recently by Neill Hutchings, timekeeper, Tennessee Coal, Iron & Railroad Company, before a meeting of clerks, and others, of that company.

Magnesite and Chrome-Ore Imports

The war's effect on our imports of magnesite and chrome ore, both so essential to the steel industry, are shown by the following Government data recently issued:

	Imports of Magnesite, Gross Tons	Imports of Chrome Ore, Gross Tons
June, 1914	5,696	3,040
June, 1915	850	80
Year ending June 30, 1913	154,098	49,772
Year ending June 30, 1914	129,238	79,842
Year ending June 30, 1915	56,560	47,051

In the case of magnesite the falling off is 54 per cent for the fiscal year and 85 per cent for June, 1915. The decrease in chrome-ore imports was 41 per cent for the fiscal year and 98 per cent for June.

The amount of crude magnesite produced and sold or treated in the United States in 1914 was 11,293 net tons, valued at $124,223, according to Charles G. Yale and Hoyt S. Gale of the U. S. Geological Survey. This is 17.2 per cent larger than the production in 1913, which was 9932 tons, valued at $77,056. This output comes entirely from six mines in California. The value assigned is computed at the rate of $25 to $30 a ton of ordinary calcined (not ground) magnesite in sacks at San Francisco, a rate about equivalent to $10 to $12 a ton for the raw magnesite at the same point. The importation of magnesite into the United States in 1914 was about 122,000 tons of calcined and 13,000 tons of crude, which with 11,293 tons of raw (equivalent to about 5000 tons calcined) for the domestic production makes a total equivalent to about 132,000 net tons as calcined magnesite. About 96 per cent, therefore, of the amount used is imported and of this nearly 93 per cent comes from Austria-Hungary and 3 per cent from Greece.

The Japanese Government has planned to extend the plant of the steel works at Edamitsu so as to meet the demand for heavier gages of sheets and $1,200,000 has been voted for extensions.

Judicial Decisions

ABSTRACTED BY A. L. H. STREET

PATENTABILITY OF INVENTION.—Patentable novelty is sometimes found in discovering what is the difficulty with an existing structure and what change in its elements will correct the difficulty, even though the means for introducing that element into the combination are old and their adaptation to the new purpose involves no patentable novelty. (United States Circuit Court, Second Circuit, Miehle Printing Press & Mfg. Company vs. Whitlock Printing Press & Mfg. Company, 223 Federal Reporter, 647.)

DROP FORGE SHOP AS NUISANCE.—In refusing to enjoin operation of a drop forge shop as constituting a nuisance, the Supreme Court of Schenectady County, New York, decided that, before it can be held that such an establishment is a nuisance, it must be shown that the complaining person has sustained unnecessary damage or annoyance on account of the shop being conducted in an unreasonable manner. (Pawlowicz vs. American Locomotive Company, 154 New York Supplement, 768.)

SELLER'S LIABILITY FOR DEFECTIVE PIPE.—When piping is sold by a manufacturer with knowledge that it is to be used by the buyer under hydrostatic pressure, the law implies a warranty on the part of the seller that the piping will prove reasonably fit for the intended purpose, in the absence of a disclaimer of warranty. And on breach of such warranty the manufacturer is liable for such damages as are sustained by the buyer as a natural and direct consequence of the breach. (Pennsylvania Supreme Court, Jones & Laughlin Steel Company vs. Wood, 94 Atlantic Reporter, 1067.)

AUTHORITY OF REPRESENTATIVES AND EMPLOYEES.—In a suit involving the validity of a contract made by the bookkeeper of a firm of railroad contractors to sell a quantity of scrap iron, the Washington Supreme Court decided the following points of law relating to the authority of employees: As between employer and agent, the scope of the latter's authority is that authority which is actually conferred upon him by the former, which may be limited by secret instructions. Such instructions do not affect third persons ignorant thereof, and, as between the employer and third persons, their mutual rights and liabilities are governed by the apparent scope of the agent's authority, which is that authority which the employer has held the agent as possessing, or which he has permitted the agent to represent that he possesses. The apparent authority, so far as third persons are concerned, is the real authority; and, when a third person has ascertained the apparent authority with which the principal has clothed the agent, he is under no further obligation to inquire into the agent's actual authority. The authority must, however, have been actually apparent to the third person, who, to avail himself of rights thereunder, must have dealt with the agent in reliance thereon in good faith and in the exercise of reasonable prudence, in which case the principal would be bound by the acts of the agent performed in the usual and customary mode of doing such business, although he may have acted without, or in violation of, private instructions, where such acts are within the apparent scope of his authority. (Caughren vs. Kahan, 150 Pacific Reporter, 445.)

VALIDITY OF VERBAL CONTRACTS.—Under the statute which makes an agreement for sale of goods at a price of $50 or more invalid unless it is evidenced in writing, except where there is at least partial delivery to the buyer or partial payment by him, a verbal agreement is validated by the buyer's acceptance of part of the goods contracted for. (Minnesota Supreme Court, Scott vs. T. W. Stevenson Company, 153 Northwestern Reporter, 316.)

CONTRIBUTORY NEGLIGENCE OF ROLLING-MILL EMPLOYEE.—Plaintiff sues for injuries sustained while employed as a rougher, in assisting in feeding iron bars on a set of rolls, through being caught in a moving sprocket. It appears that a guard had been removed from the sprocket in making a change in the machinery, and that plaintiff disobeyed an order from his foreman to replace the guard. Held, that he was guilty of contributory negligence, barring recovery of damages. (Pennsylvania Supreme Court, Peifer vs. Reading Iron Company, 94 Atlantic Reporter, 744.)

BREACH OF CONTRACT TO BUY MOLDING SAND.—The damages recoverable for breach of a contract to buy molding sand is the excess of the agreed price above the market value, the seller having made no tender of delivery. In order to recover the contract price, the seller must at least show, in the absence of tender, that there was no market for the sand in which a resale could be made and the damages could be thereby reduced. (New York Supreme Court, Van Olinda vs. Whitehead Brothers Company, 154 New York Supplement, 339.)

PHASES OF SALES CONTRACTS.—An agreement for sale and delivery of goods to be manufactured in the future is valid although not reduced to writing. An order for goods becomes a contract, binding the buyer to buy, when it has been accepted by the seller, and on breach of that contract the seller is entitled to retain the goods and recover as damages the excess of the contract price above the market value of the goods at the time and place agreed upon for delivery. (Minnesota Supreme Court, Greenhut Cloak Company vs. Oreck, 153 Northwestern Reporter, 613.)

RIGHTS UNDER AGENCY CONTRACT.—William Atkins & Co., Sheffield, Eng., constituted the defendant sole agent in the United States for sale of steel, under a contract providing for consignment of steel to defendant "f.o.b. New York, duty paid." Shipments were to remain the property of Atkins & Co. until sold, defendant remitting monthly for stock sold at prices mentioned in the agreement. On termination of the contract on six months' written notice, as provided for by its terms, plaintiff sued to recover an amount claimed to be due under the agreement. Held, that under the contract the defendant was not entitled to counterclaim for transportation charges from New York to Newark, the place of business of defendant, or for handling charges at Newark. (New Jersey Court of Errors and Appeals, Kelley vs. Faitoute Iron & Steel Company, 94 Atlantic Reporter, 802.)

AUTHORITY OF TRAVELING SALESMEN.—The fact that a traveling salesman is authorized by his employer to make collections in cash or in checks payable to the employer does not impliedly give him authority to collect the proceeds of such checks, and a bank may be held liable for the proceeds on crediting them to the personal account of the salesman. (Kansas City Court of Appeals, Kansas City Casualty Company vs. Westport Avenue Bank, 177 Southwestern Reporter, 1092.)

INJURY WHILE OILING MACHINERY.—An experienced machinist injured through his hand becoming caught between cogwheels while oiling machinery in motion is not entitled to recover against his employer, although the cogwheels were left unguarded in violation of law, the accident being caused by the employee's use of a short spouted oil can. (Pennsylvania Supreme Court, Barrientos vs. Brennan, 94 Atlantic Reporter, 927.)

MECHANICAL EQUIVALENTS IN CONFLICTING PATENTS.—Whether the parts of two machines are mechanically equivalent, on a question of patent infringement, is to be determined by their functions and the principles of their construction and operation, and not by their form. (United States District Court, Southern District of New York, Read Machinery Company vs. Jaburg, 221 Federal Reporter, 662.)

ASPECTS OF COMPENSATION ACTS.—The Connecticut workmen's compensation act covers accidents occurring outside the State under employment entered into within its borders. (Connecticut Supreme Court of Errors, Kennerson vs. Thames Towboat Company, 94 Atlantic Reporter, 372.) Willful contributory negligence of an injured employee does not preclude an award of compensation to him for injury received in the course of his work, under the New Jersey compensation act, unless the injury was self-inflicted or resulted from intoxication. (New Jersey Supreme Court, Taylor vs. Seabrook, 94 Atlantic Reporter, 399.)

Customs Decisions

SHOE MACHINERY

Skiving machines and knives or parts thereof have been held by the Board of United States General Appraisers to be free of duty under the present tariff law, as "shoe machinery, or parts." George H. Diehl, Jr., New York, the importer of the merchandise, objected to the action of the collector in returning the articles as metal manufactures with duty at 20 per cent. At the trial the evidence was convincing that the machines and the parts in controversy are largely used in making shoes, although they have other uses.

VESSEL ENGINES

A. E. Outerbridge & Co., New York, were sustained by the board in a claim for free entry, under the Panama Canal act, for various articles and materials for use in building a triple expansion engine and propelling equipment for installation in the British steamer Princess, which was at the time of the arrival of the merchandise in this country under construction in a Brooklyn shipyard. The usual rate of 20 per cent as manufactures of metal was taken by the custom house authorities. The clause in the Panama Canal act, under which claim was made by the importers, specifies free entry for foreign materials entering into the construction of vessels building in this country. The assistant attorney general, in behalf of the Government, moved that the protest be dismissed for lack of compliance with the regulations of the Treasury Department, while the same official also alleged that the material imported constituted a complete engine. The board ruled that both objections were not well founded. Free entry was ordered.

SEWING MACHINE TABLES

While the tendency of judicial decisions has been to give a broad construction to the sewing machine provisions of the tariff act of 1909 and the present law, the Board of United States General Appraisers indicates, in a decision just handed down, that the application of the existing act has its limitations. This inference is drawn from the board's ruling in the protest case of the Singer Mfg. Company, which imported, under the act of 1913, power transmitting tables composed in chief value of metal and capable of operating at the same time from five to twenty sewing machines. The customs authorities at New York assessed the tables at the rate of 20 per cent under the provision in the law for "manufactures of metal not specially provided for." Free entry was claimed under the provision in paragraph 441 for "sewing machines, whether imported in whole or in parts." With the exception of the table tops, which are made of wood and supplied in this country, and of the necessary leather belting, the importation in question contained all of the parts required to equip single and double power transmitting tables or benches used in connection with the operation of sewing machines. The single tables are designed to support five machines and the double ten machines. It was shown at the hearing that power is transmitted to the various machines by means of an electric motor attached to one end of the table. Neither the motors nor the sewing machines, however, were included in the shipment.

Judge Fischer, in his decision for the board overruling the importer's contention, says the sole question to be determined is whether these transmitting tables or benches are "parts of sewing machines" within the purview of the tariff law. He answers the question in the negative. In part, the decision says: "Surely, Congress never contemplated including within the scope or meaning of the term 'parts of sewing machines' any such extensive and elaborate power transmitting appliance or apparatus as is embodied in each of the power tables or benches here under considerattion. In our view of the case, these tables more nearly approximate the ordinary factory appliances and power transmitting apparatus than they do a combination of sewing machine parts. There are in the tables certain attachments and devices which merely operate to transmit the motive power from one machine to another, and which form absolutely no part of any of the machines. If these are to be considered parts of sewing machines, then with the same propriety it may be claimed that the electric motor which supplies the motive power is likewise a part of the sewing machine. Moreover, it is not at all conclusively established that other than sewing machines could not as well be operated on these power transmitting tables. In fact, the testimony of the importer's own witness is to the effect that he knew of no particular reason why any lightly constructed machine could not be so operated."

Higher Mail Pay to Railroads

The Railway Business Association is endeavoring to arouse public sentiment in favor of an increase of at least 10 per cent in the pay of the railroads for mail service. It has sent to business men throughout the country a bulletin, embodying an address to Congress protesting against the present rates paid by the Post Office Department to the railroads for carrying the mails.

The Railway Business Association, which is a national organization of manufacturing, mercantile, and engineering concerns dealing with railroads, urges that mail be weighed yearly for ninety days to estimate the volume, and consequent compensation to the railroads, instead of weighing it every four years. An injustice was done to the railroads, the association contends, when the parcel post was established in 1913. As the country is divided into four parts, the mail in one of which being weighed each year, it will not be until 1917 that the railroads of one of the districts receive compensation for the increased tonnage, the bulletin points out.

In ten years, according to the statement, the Post Office receipts increased 100.5 per cent, but the total mail pay to railroads was only 27.7 per cent more. The bulletin continues: "Mail pay ought not to be affected by the Post Office Department balance sheet. The roads should receive not what the department is willing to pay them but what their services are worth. Congress should lay down the rule that compensation shall be equivalent to what private shippers would pay for similar service. There is no more reason for taking the postal deficit out of the railroads than out of letter-carriers or building contractors."

The Postmaster-General, being an interested party, the bulletin urges, should not have final arbitrary authority over matters in dispute between the railroads and his department. The proposed space system of compensation is looked upon with disfavor by the association. "Under the weight system now in use the department subordinates report what the scales record. Under the proposed space system they would perform a function involving judgment and putting a much greater strain on their impartiality as between the carrier and the government. Payment should vary according to the length of haul, speed and frequency of mail trains. The present law ignores all these."

Business men are requested to write to their Congressman urging the increase as set forth above.

A simplified ferrous sulphate method for the determination of vanadium in steel is published in the Journal of Industrial and Engineering Chemistry by George T. Dougherty, chief chemist at the plant of the American Steel Foundries, Indiana Harbor, Ind. In the application of Johnson's or similar methods for the determination of vanadium in steel, considerable difficulty is often experienced in producing a colorless or "old rose" shade with ferrous sulphate in the solution containing an excess of permanganate after the preliminary oxidation of the vanadium, and in obtaining consistent results on blank steels and vanadium steels. Mr. Dougherty's method, it is claimed, obviates this difficulty.

Announcement is made by the American Steel Foundries that two furnaces in its plant at Granite City, Ill., have been started, after having been closed for about a year. The product is mainly railroad equipment.

Book Reviews

Standard Iron-Steel-Metal Directory. List of iron, steel and metal manufacturers and dealers in the United States and Canada. Pages 952, 6 x 9 in. Published by Atlas Publishing Company, 150 Lafayette Street, New York. Price, $8.

This publication is especially valuable to those who have supplies to sell to steel works, iron rolling mills, iron and brass foundries and related industries. The contents are conveniently arranged for the purposes for which the directory is intended. The greater part of it is devoted to a list of names of manufacturers of iron and steel, makers of iron and brass castings and manufacturers or smelters of metals, arranged by States and cities, and presented in alphabetical order. Under the name of each city are given the names of all the establishments in it which come under the purview of the directory. Not only are the addresses of manufacturers given but considerable information follows, showing whether the establishment is a corporation or a copartnership, with its capital, officers, purchasing agent, equipment, capacity, character of products and fuel and raw materials used. Classified lists then follow, such as steel manufacturers, bar-iron mills, sheet mills, rail mills, malleable iron foundries, carwheel foundries, blast furnaces and pig-iron merchants, machinery dealers, scrap-iron brokers and yard dealers, dealers in second-hand pipe and supplies, dealers in new and relaying rails, brass and copper rolling mills, brass founders, galvanizers, car-box and journal-bearing manufacturers, manufacturers and jobbers of plumbing supplies, manufacturers of aluminum, scrap metal smelters and dealers, ingot metal manufacturers and brokers in new metals, automobile manufacturers, dealers in foundry supplies and equipment, and railroad purchasing agents. A feature of the book which will prove of great convenience to the user is an alphabetical index of all iron and steel manufacturers, iron and brass founders and metal smelters in the United States and Canada, giving the page in the volume on which a description of the company appears. The book presents convincing evidence of careful compilation and intelligent treatment.

Wood Pattern Making, by Howard Traicon Purfield. Third edition. Pages, 242, 5⅛ x 7¾ in.; illustrations, 168. Published by the Manual Art Press, Peoria, Ill. Price $1.25.

The first edition of this book, which was published nine years ago, was based on the author's experiences of seventeen years in teaching pattern making and kindred subjects to provide a text-book for students in technical and manual training schools and universities, and the present edition, the third, is revised and contains several additions. While the author recognizes that pattern making is an art which cannot be learned simply by reading, he has produced a book that will be of assistance to the artisan as well as to the engineer or draftsman. In the revision, the arrangement of the subject matter has been changed, so that the chapters on tools and their use appear at the beginning of the book instead of at the end. Instructions are given on the preparation of the various standard patterns and considerable space is devoted to miscellaneous types.

The Bureau of Foreign and Domestic Commerce has issued a new edition of its directory of "Commercial Organizations of the United States." This is stated to be the most complete list of organizations directly related to the commercial life of the country that has ever been issued. The first edition, prepared in 1913, was widely circulated in the United States, and copies were also in use in foreign countries in all parts of the world. With a complete revision, the book is expected to be still more valuable to business men and to those who wish to reach business men in the larger groups that are here represented. In addition to data relating to dues, income, number of members, and date of annual meeting, the field of service and special activities of the respective local organizations are shown as far as practicable by the use of symbols. Copies of the publication may be obtained at 15 cents each from the Superintendent of Documents, Washington, D. C., or from the branch offices of the Bureau of Foreign and Domestic Commerce.

The "Buying and Selling of Ores and Metallurgical Products" is the title of Technical Paper 83, recently issued by the U. S. Bureau of Mines. The aim is to outline clearly the underlying principles. In estimating the value of an ore or an intermediate metallurgical product (other than a refined metal) the basis used is the price of the refined metal at some principal market center.

The production of sulphate of ammonia in 1914 is the subject of a booklet published by the American Coal Products Company, 17 Battery Place, New York City. The statistics cover the production of other countries as well as the United States and are of course of interest in view of the development of the by-product coke oven industry.

Efficiency Society Meeting

Factory efficiency, distribution efficiency, office efficiency and national efficiency are among the subjects to be considered at the fall convention of the Efficiency Society to be held at the Lake Placid Club, Essex County, N. Y., Sept. 17, 18 and 19. Among those who are to take part are the following:

C. B. Auel, director of standards, processes and materials, Westinghouse Electric & Mfg. Company, East Pittsburgh.

F. C. Blanchard, works manager, Ashcroft Mfg. Company, Bridgeport, Conn.

Sterling H. Bunnell, chief engineer, Griscom-Russell Company, New York City.

John Calder, president Manufacturers Equipment Company, Boston.

Henry L. Gantt, consulting industrial management engineer, New York City.

C. H. Groesser, assistant works manager, Manning, Maxwell & Moore, New York City.

C. E. Knoeppel, president C. E. Knoeppel & Co., counsel in organization and management, New York City.

Dwight V. Merrick, consulting management engineer, New York City.

Roger W. Babson, Babson's Statistical Organization, Wellesley Hills, Mass.

Prof. Norris A. Brisco, Iowa State University.

Hamilton Holt, editor *The Independent.*

F. W. Keough, editor *American Industries.*

W. B. Maclean, advertising manager, Otis Elevator Company, New York City.

E. P. Beebe, assistant treasurer, THE IRON AGE.

Dr. Melvil Dewey, president Lake Placid Club and president Efficiency Society.

Manganese Ore in California

In 1914 several deposits of high grade manganese ore were discovered in California, some old mines reopened and companies formed to exploit them, according to D. F. Hewitt, of the U. S. Geological Survey in "The Production of Manganese and Manganiferous Ores in 1914." The most promising deposits are those opened by the Thomas mine near Ukiat, Mendocino county, and by the Shasta Copper Company near Heroult, Shasta county. Both of these were prospected during the year and shipments made to the Noble Electric Steel Company at Heroult, which is producing ferromanganese. The Ladd mine in San Joaquin county was reopened and ore shipped from accumulated stock. The Western Manganese Company has erected a refining plant at Alameda and operates the Ladd mine under lease. Manganese ore of good grade has been mined at Kleinfelter, San Bernardino county, but none has been shipped.

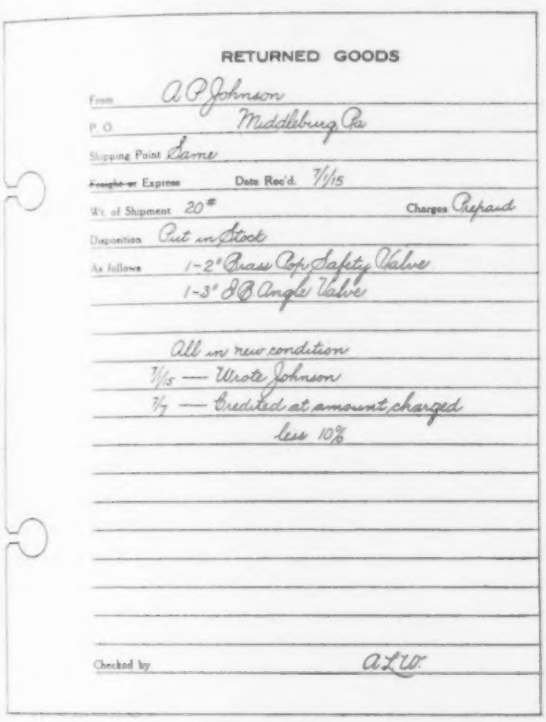
The 11,000,000 mark of attendance at the Panama-Pacific International Exposition, San Francisco, was passed on Aug. 24. The total cash profits, according to Rodney S. Durkee, controller of the exposition, has been more than $700,000 to date, and it is now estimated that the total net profits at the close of the exposition in December will approximate $1,750,000. The average attendance in late weeks has averaged 73,000 a day.

RECORDING RETURNED GOODS

How One Manufacturer Takes Care of Shipments Received Without Instructions

BY H. A. RUSSELL

Almost every factory has had the experience of having shipments or parts of shipments fired back by the customer without any preliminary correspondence. These out-of-the-regular shipments are always the ones that cause the most trouble. If the goods are in salable condition when received, they are liable to become mixed with the regular stock, while if in second-hand condition, they may be scrapped. In any event the record may easily become a confused one unless some care is taken to list


RETURNED GOODS

From A P Johnson

P. O. Middleburg Pa

Shipping Point Same

Freight or Express Date Rec'd. 7/15

Wt. of Shipment 20# Charges Prepaid

Disposition Put in Stock

As follows 1-2" Brass Cp. Safety Valve
1-3" IB Angle Valve

All in new condition
7/15 — Wrote Johnson
7/17 — Credited at amount charged less 10%

Checked by A L W

Blank Used by an Agricultural Implement Maker for Entering Shipments Received from Customers without Instructions

each of these shipments when received and this list must be filed so that it is instantly available. By referring to the illustration we will find a complete record of a shipment received from a customer. This record was filled in by the receiving clerk on the same day the shipment came in and held at his desk until the matter had been adjusted.

When a shipment of this kind is received, which for some reason or other cannot be disposed of at once, all of the parts are carefully tagged and the customer's name and the date are written on the tag. Each tag will indicate the total number of units in the shipment. It would be a big help to everyone concerned if the railroads and express companies would refuse to receive a shipment unless the name and address of the shipper were as much in evidence as the name of the consignee.

Several times a year we receive boxed shipments with the written instructions tacked on the inside of the box, and it all depends on which side the board falls when taken off the box, whether the instructions will be noticed or not. At other times we receive prepaid shipments of old parts, probably to be duplicated with new parts, but not a trace of the shipper's name can be found. Then the transportation company is written to and after a delay of days —sometimes weeks—we secure the necessary information and then there is a further delay until we get in touch with the customer.

One of the amusing things of life is that we frequently get a letter from some isolated place in which we are given the benefit of the writer's opinion of the world in general and ourselves in particular, because we have not shipped "those repairs." Probably we have been worrying everybody we could for the customer's name and shipping point. It is even possible that we may have had correspondence with this party regarding the parts needed but some time previous to the receipt of the shipment. And as the customer's description of the parts he wants replaced or repaired is generally different from the catalog names, there is often no connecting link for the memory when the old parts come in.

The sheets we use are for a regular 7 x 8½-in. binder and are filed under the standard A-Z alphabetical index. This record has proved of value as long a time as several years after the receipt of the shipment.

The Iron and Steel Institute's Fall Meeting

The autumn meeting of the Iron and Steel Institute will be held Sept. 23 and 24 at the Institution of Civil Engineers, London, England. The list of papers for presentation and discussion follows:

"Influence of Oxygen on Some Properties of Pure Iron," by Wesley Austin.

"Note on the Carburization of Iron at Low Temperatures in Blast Furnace Gases," by T. H. Byrom.

"Influence of Heat Treatment on the Specific Resistance and Chemical Constitution of Carbon Steels," by Prof. E. D. Campbell.

"Effect of Chromium and Tungsten on the Hardening and Tempering of High-Speed Tool Steel," by Prof. C. A. Edwards, and H. Kikkawa.

"Phosphorus in Iron and Steel," by W. H. Hatfield.

"The Magnetic Transformation of Cementite," by Prof. K. Honda and H. Takagi.

"Sulphur in Malleable Cast Iron," by R. H. Smith.

"Iron and Nitrogen," by Prof. N. Tschischewski.

In the absence of Adolphe Greinar of Seraing, Belgium, president of the Institute, Arthur Cooper, immediate past-president, will preside.

Barb Wire Exports for One Year

The demands of the countries at war for the barb wire produced in the United States are shown by the following table:

	Exports of Barb Wire, Gross Tons	Exports of All Other Wire, Gross Tons
June, 1914	6,724	6,898
June, 1915	22,787	28,536
Year ended June 30, 1913	87,528	137,795
Year ended June 30, 1914	79,775	84,318
Year ended June 30, 1915	147,591	147,136

Exports of barb wire in June, this year, are 238 per cent in excess of those for June, 1914. The total for the fiscal year ending with June, 1915, is 85 per cent greater than that for the fiscal year of 1914 and 68.5 per cent greater than for the same year in 1913. The increase in the case of all other wire is only 6 per cent for the fiscal year, this year, over that of 1913, but nearly 75 per cent greater than the exports ended with June, 1914.

Horseshoe nails of German and Swiss make are used exclusively in the section of Santiago de Cuba, Cuba, according to Consul P. M. Griffith. They were introduced three years ago and are said to be much cheaper than American nails and superior both in flexibility and tenacity. Boxes of 22 lb. retail at $2.25. No American horseshoe nails have been for sale, but as the European supply is practically cut off, this is suggested as an opportune time to introduce the American product.

The Edwards Mfg. Company, Cincinnati, Ohio, has made a shipment of 138 of its forged steel trucks to Panama for Government use. These trucks, which were illustrated in THE IRON AGE, Dec. 24, 1914, are of the two-wheel type for handling barrels, boxes, etc., and are made entirely of steel.

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EDITORS:
A. I. FINDLEY
GEO. W. COPE W. W. MACON
CHARLES S. BAUR, *Advertising Manager*

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Anti-Dumping Legislation

There will be little difference of opinion among American manufacturers on the proposal that is under serious consideration by the Administration, to amend the Underwood-Simmons tariff act by making an anti-dumping proviso. It need not be dwelt upon here, that such a proposition, like the continuation of the war tax and the possible retention of the sugar duty, is brought forward as one of the measures prompted by the exigencies of war. Nor should those who have consistently stood for protection to home industries put too much emphasis on the fact that support for this one method of guarding against unfair competition from abroad is now coming from unexpected quarters. The war has changed many points of view. It may yet raise up friends for a tariff commission that some day will make tariff schedules a matter of reason and economics instead of hot partisanship.

As our Washington correspondence points out, in the days of more or less highly protective duties agitation for an anti-dumping enactment met the objection that the average tariff was high enough to balance any cuts the foreign manufacturer might make to get his surplus into this market. But the sweeping reductions of the Underwood bill have changed all that. And now, after passing a law that opened our markets to attack as they were never open before, the Administration faces the necessity of modifying its fiscal policy. That it chooses a way that to its mind obviates the necessity of a general revision of the present tariff is not surprising. But whether the undoing of the tariff work for which Congress was hurried to Washington in 1913 must not go farther is a question on which much is certain to be heard in the coming year.

Nothing is more obvious in this whole problem than the advantages the industries of the United States now enjoy from the artificial trade barrier raised by the war. American manufacturers have not forgotten, however, that during the fiscal year 1914, which immediately preceded the great conflict, domestic industries were languishing, while at the same time there was a constantly increasing flow of foreign commodities into our markets. The European war, with all its unparalleled devastation, has not brought about the destruction of a single important manufacturing plant in Germany, France or England. On the contrary, establishments in some lines, including the iron and metal-working trades, have been expanded for the production of war material. When the war ends there will be an enormous surplus to dump upon the American market, since that will be the line of least resistance. Great Britain will certainly readjust its fiscal policy to meet the enormous debt imposed by the war, creating tariff barriers that will be even more effectual than animosity in keeping out the German product. Liberals and Unionists will be forced to unite in passing measures that will both provide adequate revenue and protect British industry against German dumping. It would be the height of folly, under such a condition, if in the United States maneuvering for partisan advantage prevented the adoption of measures for which the unparalleled events of the past year have raised up new adherents.

Automobile Industry Helps Steel Trade

A tribute should be paid every now and then to the automobile industry for the manner in which it befriends the steel trade. The automobile makers do not balk at paying fair prices to the steel mills, for what they want is quality and service. Their heaviest demand falls in a very convenient season of the year, and this is particularly true in the case of the sheet trade, for traditionally the sheet market has been most inclined to weakness in midwinter, when the automobile builders are usually pushing for maximum output.

The automobile builders have contributed very largely indeed in showing what can be done with steel, both by alloying and by heat treatment, and the publicity thus given tends to facilitate and encourage the consumption of special steels in other industries. Even from one year to the next the automobile industry makes marked progress in making steel yield better service in such important parts as axles and gears.

The quantity of steel consumed by the automobile industry has increased steadily, and now runs into hundreds of thousands of tons a year. Such commodities as sheet piling and railroad ties, nominally in the so-called "tonnage" class, furnish an insignificant demand even in point of tonnage compared with that of the automobile industry.

It might be remarked incidentally that the automobile industry has brightened the wits of the

machine-tool builders in a truly remarkable way, and has thus rendered a distinct and important service to the machine-tool industry; but that is another story.

Export and Domestic Steel Demand

It is remarkable how well the export demand and the domestic demand for steel have dovetailed together, producing a condition in which unfinished steel is scarce while there is no uncomfortable scarcity of any finished steel product. American rolling mills have not had a reputation for flexibility; rather they have been very largely specialty mills, and this fact makes the situation the more remarkable, seeing that the export demand for steel runs very strongly to a relatively small number of products.

The chief reason for this very convenient fit is that in the strictly domestic demand the railroads have figured very lightly indeed. More than one-half the locomotives ordered thus far this year have been for export, but the American roads have bought very few locomotives compared with their past records. A very considerable proportion of the freight cars ordered has been for export, but here again our railroads have been relatively small buyers.

The gap between rail making capacity and the purchases of rails by domestic roads is the widest, and here the export demand has very nicely bridged the gap. There has been a relatively large demand for rails for export, while there has been a spectacular demand for large steel rounds, such as can be rolled very satisfactorily in rail mills. A number of the great rail mills of the country are now producing these rounds, and in large tonnages. It does not appear that this is simply an overflow from the merchant mills. The demand for ordinary merchant steel bars is unusual. It may be well to mention that merchant bars, although commonly regarded as a staple, are not in the category of those commodities the demand for which fluctuates the least, such as wire products and tin plate. On the contrary, the demand for bars varies more greatly than the demand for steel in general. For instance, from 1907 to 1908 the production of rolled iron and steel decreased 40 per cent, while the production of merchant bars decreased 50 per cent. Again, from 1913 to 1914 the production of rolled material decreased 26 per cent, but the production of bars dropped 36 per cent, and that despite the fact that some large rounds for shells were rolled in 1914. It may quite readily be accepted, therefore, that in this general movement the ordinary domestic demand for merchant bars has become unusually large, and it is particularly fortunate that the rail mills are able to help out the bar mills.

An exception to test the general rule may be found in wire. The export demand for wire has been unusual, while the domestic demand is one that changes relatively little from year to year. It is always seasonably light in June and July, usually in August also, but this year the wire mills have run full through their normally dull period. Later we may see, and probably will, a pronounced scarcity of wire.

If light railroad demand has been the chief factor in enabling American steel mills to cope with an unusual and peculiarly distributed export demand for steel, it follows that while this export situation continues the railroads may not find it easy in future to secure large tonnages of the materials they require, and rails in particular.

The value of high-speed steel-scrap has grown so enormously, along with the advances in price of high-speed steel itself, that it is not uncommon to find in machine shops where much of the steel is being used that good-sized, strongly built wooden boxes have been provided for accumulating the cuttings. By guaranteeing a careful segregation of this scrap material it is possible to get a price of 20c. a pound, and in some cases a higher price is expected. When it is realized that it is not so very long since this material brought no more than ordinary borings and turnings, sometimes $6 a ton, an idea may be gained of its appreciation in value. It is much greater proportionately than the advance in high-speed steel in the last half-year, though high-speed steel is now roughly two and one-half times as expensive. In some shops the larger pieces are collected separately from the cuttings, with the idea that these will command a better price.

Pittsburgh-Pacific Freight Rates

It is expected that the Wabash-Pittsburgh Terminal Railroad will soon announce a through rate on articles of iron and steel of 55c. per 100 lb., in carloads, from Pittsburgh to the Pacific coast. The consent of the Interstate Commerce Commission for the issuance of such a rate will have to be obtained, but there will probably be no trouble in securing it. Should this railroad be allowed to name such a rate, the other lines would probably follow. It is said that they are doing all in their power to prevent the Wabash-Pittsburgh Terminal from taking its contemplated action. The present rate from Pittsburgh to the Pacific coast on iron and steel articles is 75c., of which the roads hauling the freight from Pittsburgh to Chicago get 11.2c. Should the rate be reduced to 55c., it would make the all-rail rate from Pittsburgh to the coast almost as low as the present rates by rail from Pittsburgh to New York and thence by water through the Panama Canal. When the canal was first opened, the rate from Pittsburgh to the coast via the canal was fixed at 45c., but, owing to the large amount of business offered, the rate has been somewhat higher since. The rate of 55c. from Pittsburgh by all rail would be a great advantage for Pittsburgh shippers, as the time thus made is much quicker than via the Panama Canal.

Tin Mining in Alaska

In view of the interest in an adequate tin supply for the United States and the discussion of the smelting of Bolivian ore on the Atlantic seaboard, and possibly on Puget Sound, the United States Geological Survey has issued a special bulletin on tin mining in Alaska. The Survey was closely identified with the finding of lode deposits of tin there after prospectors went to Lost River and discovered a vein of lode tin. This lode has since been extensively mined. Some of the Alaska tin ore has been reduced at Seattle, Wash., within the last two years. The report just issued presents a review of other work by the Geological Survey and the re-examination of the more important tin deposits by Geologist Henry M. Eakin. The total tin production for the period 1902-1914 amounted to 526 tons of metallic tin, valued at $380,000. The Alaskan tin ores have heretofore been shipped for reduction to Swansea (Wales) and Singapore.

TO PREVENT DUMPING

The Administration May Favor a Move to Hold Back Europe's Surplus

WASHINGTON, D. C., Sept. 7, 1915.—It is highly probable that the Administration will recommend to Congress at its coming session the enactment of an amendment to the Underwood-Simmons tariff law in the form of an anti-dumping proviso, designed to prevent foreign manufacturers from flooding American markets with their surplus products, especially during periods of depression. Secretary of Commerce Redfield is making a close study of this question and his recommendation to the President may find a place in the regular annual message.

The proposal that an anti-dumping clause be included in the United States tariff laws is not new. It has been discussed in Congress in connection with every tariff law enacted since 1890. For one reason or another, however, Congress has rejected the proposition, although other countries, notably Canada, have adopted it with most advantageous results. When first urged as an amendment to the McKinley law of 1890, it was withdrawn as a concession to certain moderately low-tariff Republicans who urged that the average rates of the bill, figured on an ad valorem basis, were sufficiently high to obviate all danger from any form of dumping. When the Wilson-Gorman law of 1894 was under consideration the advocates of an anti-dumping clause were met with the contention that it was a distinctly high protection measure and should have no place in a statute designed to effect a substantial reduction in duties. However, the movement was sufficiently strong in the Senate to cause the raising of many rates which had been slashed by the House. The matter came up in connection with the Dingley bill in 1897 and the Payne-Aldrich act of 1909, but without action. When the Underwood-Simmons bill was up, the avowed purpose to make heavy reductions all along the line disheartened the advocates of an anti-dumping provision, and although there was some desultory discussion of the matter there was no organized movement.

The result is that American manufacturers now find themselves threatened with unusual competition as soon as the European war is over. With a materially reduced demand at home, due to the impoverishment of the people, and with little call for their goods from other European countries, foreign manufacturers will naturally center their attention upon the American market and every effort will doubtless be made to invade it.

Secretary Redfield's attention has been drawn to this matter as the result of his official investigation of the problem of producing certain chemicals and dyestuffs in the United States. He has found that there is ample capital, sufficient technical knowledge, trained labor and an enormous demand for output; but he has also found that manufacturers are unwilling to invest money in a business which can be profitable only so long as their German competitors are unable to enter the American market. A moderate increase in the duty, coupled with the enactment of an anti-dumping clause, would unquestionably create in the United States an industry that would not only be of vast advantage to American capital and labor, but would also guarantee the consumer against such costly interruptions in the flow of supplies as have occurred from time to time since the beginning of the European war and which have now brought many large manufacturers to the verge of ruin.

It hardly need be said that an anti-dumping clause would be of benefit to every line of domestic industry and by removing the danger of cut-throat competition would greatly stimulate production and the expansion of manufacturing facilities. A feature of the problem which especially commends it to Secretary Redfield and other Administration officials is the fact that the enactment by Congress of such a provision would do much to forestall otherwise inevitable agitation for an early and comprehensive upward revision of the existing tariff.

No indications have yet developed regarding the attitude of the Congressional leaders on this subject, but manufacturers would do well to make prompt representations to their Congressmen on the advisability of enacting a carefully drawn anti-dumping clause as early as possible in the coming Congress. W. L. C.

Heavy War Exports from New York

The foreign trade department of the National City Bank of New York comments as follows on the character of recent exports from New York: "The change in the character of exports is again illustrated in the figures of the exports from the port of New York for the week ending Aug. 28. Numerous articles in which the exports of recent weeks are measured in large figures were absolutely unknown in the record of a year ago. Smokeless powder, of which the exports reported during the week ending Aug. 28 amounted to $1,313,000, is not mentioned in the export reports of the corresponding week of last year; and this is true of gun cotton, of which last week's record shows $302,000 worth; trinitrotoluol, $176,000 worth; hospital supplies, $21,000 worth; projectiles, loaded, $296,000, and empty, $53,000; military goods, $215,000; tents, $37,000; tetanus antitoxin, $8,258; aeroplanes, $126,000; hosiery, and underwear, $150,000, and automobile trucks, $1,348,000—and in none of these did the record of the corresponding week of last year show a single dollar's worth exported. In other articles the figures are almost equally striking: leather over $1,000,000 worth, against $170,000 in the same week of last year; copper ingots, $1,250,000 worth against $330,000 in the same week of last year; firearms, $323,000 against $17,000; metal working machinery, $462,000 against $51,000, and miscellaneous manufactures of iron and steel, $1,625,000 against $489,000 in the same week of last year." About 55 per cent of manufactures exported go from the port of New York.

American Rolling Mill Sales Conference

The semi-annual conference of the sales department of the American Rolling Mill Company, Middletown, Ohio, was held in that city Aug. 30. A sales and advertising campaign was planned for the coming year and other business, mainly of a routine character, was transacted. G. H. Charls, general manager of sales, presided. Among the salesmen from distant cities were the following: W. W. Sebald, C. M. Spear and F. E. Wortley, New York; George W. Donovan, Buffalo; R. D. Black, Toronto, Canada; H. A. Lord, Pittsburgh; W. J. Lafferty and M. L. Pierson, Detroit; Maynard French, Cincinnati; F. B. Milhoan, J. F. Mehlhope and D. C. Foley, Chicago; W. S. Stephenson, St. Louis, and George Wolff and J. S. Wilson, Milwaukee.

As a result of the unprecedented demand for war materials and the machine tools used in their manufacture, the Giddings & Lewis Mfg. Company, Fond du Lac, Wis., builder of vertical automatic chucking, boring and turning machines, has begun the building of engine lathes. At present these are built with an 18-in. swing, with either a four-step cone pulley and a single back gear or a three-step cone pulley with double back gears, the feed in both cases being of the positive geared type.

An involuntary petition in bankruptcy has been filed against the Lyons Boiler Works, DePere, Wis. The petition alleges that the company has liabilities of $100,000 and assets of $60,000. The People's Savings & Trust Company, Green Bay, Wis., was appointed receiver.

Must Observe British Tin Regulations

As some sellers of tin appear to be ignoring or avoiding the arrangements with the British Government under which it permits our importation of that metal, the Tin Committee of the New York Metal Exchange, under date of Sept. 1, issued the following statement to the trade:

Importations are permitted only for the purpose of supplying domestic requirements. The various forms of guarantee entered into are to be construed and observed as follows:

Form No. 1, as evidenced on its face, is to be signed by an importer who is at the same time a consumer. "Tin cleared on these blanks is for exclusive use of such consumer and must not be resold."

Form No. 2 covers importation by one party and the sale and delivery of the metal to a second party who must be a consumer. "The consumer obligates himself not to resell the tin, but only to use it for his own manufacturing purposes."

Form No. 3 is intended for use in the jobbing trade. "The jobber undertakes not to resell the tin without satisfying himself that it is intended to be used only for domestic consumption and will not be exported."

The jobber is required to use all due diligence in the carrying out of the agreement thus entered into, when selling the metal, and thereafter to stamp his invoices with a notice calling attention to the fact that the tin is sold with the distinct understanding that it shall not be exported, but must be sold or used only for the purpose of supplying domestic requirements.

The intent of Form No. 3 is to cover clearances of tin to jobbers for the purpose of supplying buyers of small lots (less than five tons). In case jobbers sell tin in lots of less than five tons or over, they are required to secure consumers' guarantees on the back of Form No. 2 for such sales, and to file them subject to inspection on demand.

The committee will be assisted in its labors by a strict conformance with the terms of these various guarantees. Non-observance thereof will render impossible further clearance of tin for account of parties infracting them, and may jeopardize the entire arrangement under which tin is imported.

Detecting Impure Platinum

A serious source of uncertainty in analytical chemistry has been eliminated by recent experimental study of the U. S. Bureau of Standards. In the steel laboratories as well as in others annoying results due to impure platinum crucibles have been frequent. The bureau has developed a delicate thermoelectric test for platinum purity which permits a rapid estimate to be made of the amount of included foreign matter, such as iridium or iron, without affecting the articles tested such as crucibles, wire gauze, dishes,, etc. This thermoelectric test is being adopted generally by large buyers of platinum ware. From the results of the investigations it is now possible to predict very closely what will be the loss in weight of a "platinum" crucible when heated, thus eliminating a serious uncertainty. Ordinary grades of platinum are found to lose from 0.7 to 2.7 milligrams per hour per 100 sq. cm. of surface at 1200 deg. C. Curiously enough the small amounts of iron always present in platinum are found to bear no simple relation to the magnetic properties. Scientific Paper No. 254 of the Bureau of Standards elucidates this subject.

Jones & Laughlin Steel Company to Make Pipe

As foreshadowed in the Pittsburgh market report on page 542 of THE IRON AGE of Sept. 2, another large pipe mill is to be built in the Pittsburgh district. Contracts have been let by the Jones & Laughlin Steel Company for the erection at its Aliquippa works at Woodlawn, Pa., of a new pipe mill which will give employment to about 1000 men. This new plant is being established in conformity to plans long since made and will not be in operation before the middle of next year. Included in the equipment will be two lap weld and two butt weld mills and a skelp mill for furnishing material. The output will consist of steel pipe running in sizes from ¼ in. to 16 in. Figures as to annual capacity are not given. Contracts for all the equipment, with the exception of the steel building and the skelp mill, have been placed with the United Engineering & Foundry Company, Pittsburgh.

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Tungsten and Tungsten Ore Soaring

A sale of a small amount of high grade tungsten ore, 72 to 73 per cent, is reported at about $33 per unit. This is an advance of $17 over the last sale reported in THE IRON AGE, Aug. 5, 1915. The market on the average grade of tungsten ore, 60 per cent, is considered to be about $30, Atlantic seaboard, but very little is to be had. Ferrotungsten, or the powdered metal, is held at $3.25 to $3.50 per pound of contained metal. In England prices are much lower than these. The quotation for the powdered metal is 7s. to 7s. 6d., while that of the alloy, 80 to 90 per cent and low carbon, is 6s. 6d. to 6s. 9d.

The Ferguson Steel & Iron Company, Buffalo, made a new record in August for tonnage of shipments, the increase being 36 per cent over the highest previous month, which was June of this year. The company contemplates extending its plant and making further additions to equipment.

After an idleness of several years, the Duncannon plant of the Lebanon Valley Iron & Steel Company at Duncannon, Pa., has resumed operations. The furnaces in the puddle mill department were fired Aug. 30, and the finishing mills were started a few days later.

CLOSE TO MAXIMUM

Further Large Increase in Pig-Iron

Steel Works Furnaces Make a Record Production in August—A Gain of 15 in Active Stacks

Pig iron production in August was 2,779,647 gross tons, or at the rate of 89,666 tons a day. In only five months previous was this rate exceeded, these being December, 1912, and January, February, April and May, 1913. August showed an increase of 216,000 tons over the output of July, or nearly 7000 tons a day. There were many changes in the list of active furnaces, 249 being in blast on Sept. 1, against 234 on Aug. 1, a net gain of 15. The capacity of furnaces in blast on Sept. 1 was 91,070 tons a day, against 86,776 tons a day one month previous. Thus pig iron production is now at the rate of 33,500,000 tons a year.

DAILY RATE OF PRODUCTION

The daily rate of production of coke and anthracite pig iron by months, from August, 1914, is as follows:

Daily Rate of Pig-Iron Production by Months—Gross Tons

	Steel works	Merchant	Total
August, 1914	46,937	17,426	64,363
September	46,344	16,409	62,753
October	41,026	16,335	57,361
November	35,305	15,306	50,611
December	33,381	15,515	48,896
January, 1915	35,998	15,661	51,659
February	44,192	15,621	59,813
March	50,036	16,539	66,575
April	52,804	17,746	70,550
May	54,655	18,360	73,015
June	59,022	20,339	79,361
July	62,895	19,796	82,691
August	67,801	21,865	89,666

OUTPUT BY DISTRICTS

The accompanying table gives the production of all coke and anthracite furnaces in August and the three months preceding:

Monthly Pig-Iron Production—Gross Tons

	May (31 days)	June (30 days)	July (31 days)	Aug. (31 days)
New York	176,423	172,193	178,545	196,426
New Jersey	6,600	6,240	6,961	6,800
Lehigh Valley	64,796	64,353	79,883	87,555
Schuylkill Valley	51,743	53,142	49,985	69,042
Lower Susquehanna and Lebanon Valley	28,001	28,116	30,422	31,966
Pittsburgh district	538,654	595,207	668,500	699,921
Shenango Valley	121,910	124,041	134,742	133,249
Western Pennsylvania	139,247	156,350	160,294	164,777
Maryland, Virginia and Kentucky	45,593	43,395	38,671	45,145
Wheeling district	83,400	93,991	100,782	112,294
Mahoning Valley	310,234	299,644	295,679	310,426
Central and Northern Ohio	165,882	175,376	196,620	224,229
Hocking Valley and Hanging Rock	15,149	22,135	22,377	25,904
Chicago district	292,891	307,554	352,601	406,508
Mich., Minn., Mo., Wis. and Col.	60,789	66,168	71,340	69,628
Alabama	146,502	158,569	165,403	180,359
Tennessee	15,656	14,353	14,815	15,225
Total	2,263,470	2,380,827	2,563,420	2,779,647

PRODUCTION OF STEEL COMPANIES

Returns from all furnaces of the United States Steel Corporation and the various independent steel companies show the following totals of product month by month. Only steel-making iron is included in the figures below, together with ferromanganese and spiegeleisen. These last, while stated separately, are also included in the columns of "total production."

Production of Steel Companies—Gross Tons

	Pig, total production			Spiegeleisen and ferromanganese		
	1913	1914	1915	1913	1914	1915
Jan.	1,981,560	1,261,430	1,115,944	15,633	17,325	18,041
Feb.	1,792,154	1,329,414	1,237,380	20,131	10,524	13,219
Mar.	1,904,878	1,704,688	1,551,082	20,546	20,133	12,274
Apr.	1,939,751	1,635,226	1,584,111	23,108	18,676	12,337
May	1,991,192	1,457,847	1,694,290	19,042	21,504	13,440
June	1,860,070	1,329,623	1,770,657	19,212	16,254	19,200
July	1,840,216	1,395,851	1,949,750	28,310	16,524	17,554
Aug.	1,833,352	1,455,054	2,101,818	20,680	11,577	27,463
Sept.	1,828,232	1,390,322	.....	24,555	13,786	.....
Oct.	1,848,634	1,271,820	.....	19,499	17,435	.....
Nov.	1,573,007	1,059,159	.....	26,765	21,977	.....
Dec.	1,298,262	1,034,802	.....	14,095	20,733	.....

CAPACITY IN BLAST SEPT. 1 AND AUG. 1

The following table shows the daily capacity in gross tons of furnaces in blast Sept. 1 and Aug. 1 by districts:

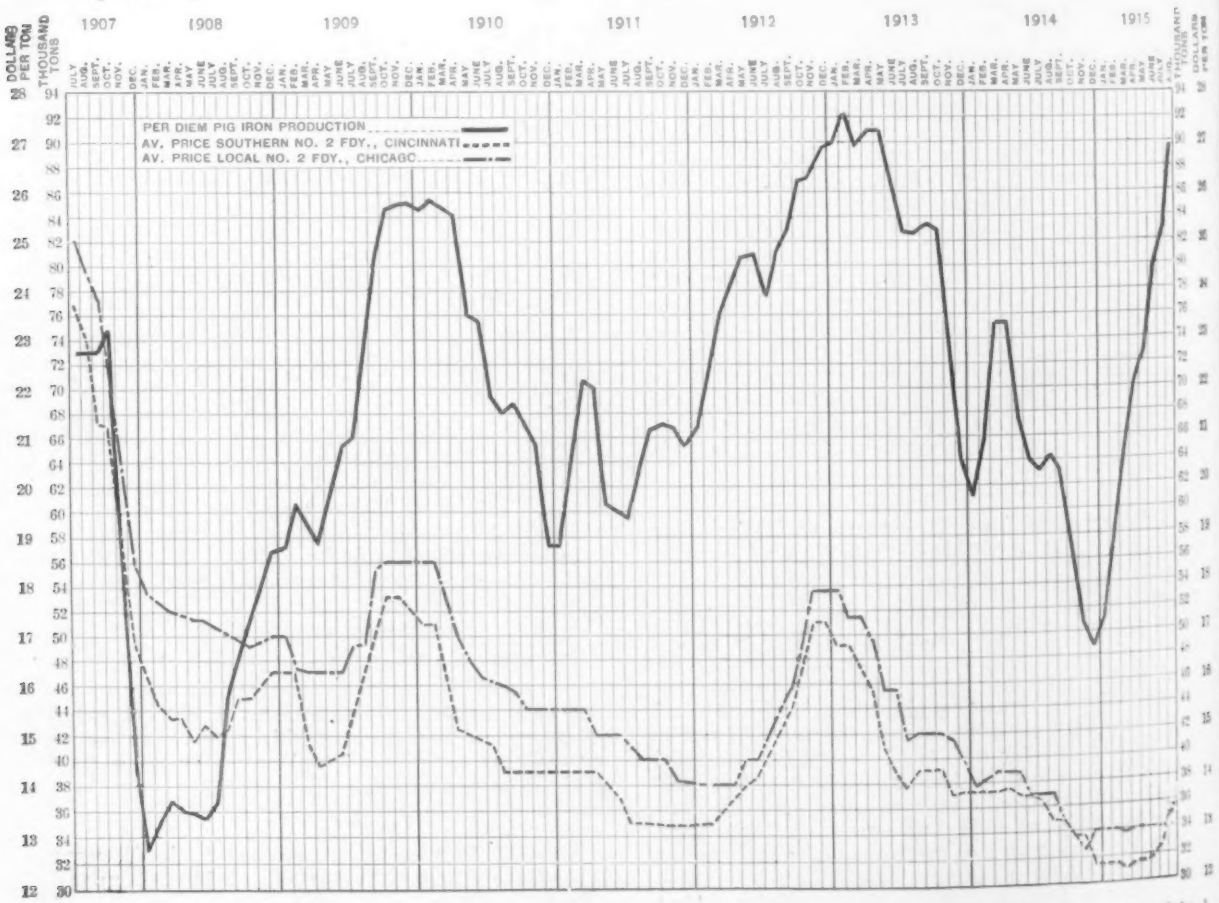

Diagram of Daily Average Production by Months of Coke and Anthracite Pig Iron in the United States from July 1, 1907, to Sept. 1, 1915; Also of Monthly Average Prices of Southern No. 2 Foundry Iron at Cincinnati and Local No. 2 Foundry Iron at Chicago District Furnace

Coke and Anthracite Furnaces in Blast

Location of furnaces	Total number of stacks	Sept. 1 Number in blast	Sept. 1 Capacity per day	Aug. 1 Number in blast	Aug. 1 Capacity per day
New York:					
Buffalo	19	16	5,956	16	5,870
Other New York	7	2	435	2	416
New Jersey	7	1	219	1	192
Pennsylvania:					
Lehigh Valley	22	11	3,045	8	2,261
Spiegel	2	2	213	2	211
Schuylkill Val.	15	7	2,227	7	2,015
Lower Susquehanna	7	3	835	2	535
Lebanon Valley	10	2	352	2	446
Pittsburgh Dist.	52	48	22,292	48	22,132
Ferro	4	3	345	2	223
Shenango Val.	19	12	4,685	11	4,347
Western Pa.	24	16	5,395	15	5,075
Ferro	1	1	60	1	130
Maryland	3	2	782	1	490
Wheeling Dist.	11	9	3,445	10	3,580
Ferro	1	1	91	1	75
Ohio:					
Mahoning Val.	25	22	10,050	21	9,538
Central and Northern	24	17	6,945	17	7,135
Hocking Val. & Hang'g Rock	15	6	645	5	725
Ill. and Ind.	34	28	13,629	24	11,840
Ferro	2	0	0	1	120
Michigan, Wis. & Minn.	10	7	1,887	6	1,650
Col. and Mo.	6	1	375	2	650
Ferro	1	1	175	0	0
The South:					
Virginia	24	5	640	4	610
Kentucky	5	1	162	1	275
Alabama	46	20	5,695	20	5,760
Tennessee	20	5	495	4	475
Total	416	249	91,075	234	86,776

Numerous changes in the list of active furnaces were made in August. Among those blown in were Port Henry in New York, Emaus and two Bethlehem in the Lehigh Valley, one Steelton in the Lower Susquehanna Valley, one Aliquippa in the Pittsburgh district, one Shenango in the Shenango Valley, Colonial in Western Pennsylvania, Oriskany and Princess in Virginia, one Sparrows Point in Maryland, one Ashland in Kentucky, Mattie in the Mahoning Valley, one Toledo in Ohio, Star in the Hanging Rock district, one Joliet and two South Chicago in the Chicago district, Thomas in Wisconsin, one in Bessemer in Alabama and Rockdale in Tennessee.

Furnaces blown out last month were Standish in New York, one Crozer in Virginia, one Bellaire in the Wheeling district, one Lorain in Northern Ohio, Bessie in the Hocking Valley, and one Sloss-Sheffield in Alabama.

DIAGRAM OF PIG-IRON PRODUCTION AND PRICES

The fluctuations in pig-iron production from July, 1907, to the present time are shown in the accompanying chart. The figures represented by the heavy lines are those of daily average production, by months, of coke and anthracite iron. The two other curves on the chart represent monthly average prices of Southern No. 2 foundry pig iron at Cincinnati and of local No. 2 foundry iron at furnace at Chicago. They are based on the weekly market quotations of THE IRON AGE. The figures for daily average production, beginning January, 1908, are as follows:

Daily Average Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1908—Gross Tons

	1908	1909	1910	1911	1912	1913	1914	1915
Jan.	33,918	57,375	84,148	56,752	66,384	90,172	60,808	51,659
Feb.	37,163	60,976	85,616	64,090	72,442	92,369	67,453	59,813
Mar.	39,619	59,232	84,459	70,036	77,591	89,147	75,738	66,575
Apr.	38,289	57,962	82,792	68,836	79,181	91,759	75,665	70,550
May	37,603	60,753	77,102	61,079	81,051	91,039	67,506	73,015
June	36,444	64,656	75,516	59,585	81,358	87,619	63,916	79,361
July	39,287	67,793	69,305	57,841	77,738	82,601	63,150	82,691
Aug.	42,851	72,546	67,963	62,150	81,046	82,057	64,363	89,666
Sept.	47,300	79,507	68,476	65,903	82,128	83,531	62,753	.....
Oct.	50,554	83,856	67,520	67,811	86,722	82,133	57,361	.....
Nov.	51,595	84,917	63,659	66,648	87,697	74,453	50,611	.....
Dec.	56,158	85,022	57,349	65,912	89,766	63,987	48,896	.....

THE RECORD OF PRODUCTION

Production of Coke and Anthracite Pig Iron in the United States by Months Since Jan. 1, 1911—Gross Tons

	1911	1912	1913	1914	1915
Jan.	1,759,326	2,057,911	2,795,331	1,885,054	1,601,421
Feb.	1,794,509	2,100,815	2,586,337	1,888,670	1,674,771
Mar.	2,171,111	2,405,318	2,763,563	2,347,867	2,063,834
Apr.	2,064,086	2,375,436	2,752,761	2,269,955	2,116,494
May	1,893,456	2,512,582	2,822,217	2,092,686	2,263,470
June	1,787,566	2,440,745	2,628,565	1,917,783	2,380,827
July	1,793,068	2,410,889	2,560,646	1,957,645	2,563,420
Aug.	1,926,637	2,512,431	2,545,763	1,995,261	2,779,647
Sept.	1,997,102	2,463,839	2,505,927	1,882,577	.....
Oct.	2,102,147	2,689,933	2,546,261	1,778,186	.....
Nov.	1,999,433	2,630,854	2,233,123	1,518,316	.....
Dec.	2,043,270	2,782,737	1,983,607	1,515,752	.....

Blast Furnace Notes

No. 2 Calumet Furnace of the Wisconsin Steel Company, Chicago, was blown in Sept. 4.

The Thomas Furnace Company, Milwaukee, Wis., blew in its furnace Sept. 1 on low-phosphorus pig iron.

No. 4 furnace of the Shenango Furnace Company, Sharpsville, Pa., was blown in on Aug. 30.

North Birmingham furnace No. 3 of the Sloss-Sheffield Steel & Iron Company, Birmingham, Ala., was blown out on Aug. 30.

No. 2 blast furnace of the Andrews & Hitchcock Iron Company at Hubbard, Ohio, which has been completely relined, while new stoves and blowing engines have been added, was blown in last week. It will make about 450 tons of iron per day. No. 1 stack, a smaller one, was blown out and will be relined and repaired.

Bessie furnace, New Straitsville, Ohio, which has been running on ferrosilicon for several months, was blown out in August for relining.

All the six furnaces of the Bethlehem Steel Company were in blast on Sept. 1, two having been blown in in August.

The Toledo Furnace Company blew in its A furnace at Toledo, Ohio, on Aug. 9. B furnace has been out for repairs since Sept. 2.

Mechanical Engineers' San Francisco Meeting

The papers to be read at the September meeting of the American Society of Mechanical Engineers, to be held on Thursday and Friday, Sept. 16 and 17, in the week preceding that given over to the International Engineering Congress, are as follows:

"Engineering Features of the Panama-Pacific International Exposition," by G. L. Bayley, chief electrical and mechanical engineer of the Exposition.

"Mechanical Engineering at the Panama-Pacific International Exposition," by G. W. Dickie.

"The Heavy Oil Engine, Its Present Status and Future Development," by A. H. Goldingham, De La Vergne Machine Company, New York.

"The Diesel Engine and Its Application in Southern California," by W. H. Adams, Throop College of Technology, Pasadena, Cal.

"The Strength of Gear Teeth," by G. H. Marx and L. E. Cutter, Leland Stanford University.

The headquarters of the society are at the Clift Hotel, while the meetings are to be held in the hall of the Native Sons of the Golden West, Mason Street, between Geary and Post streets, San Francisco.

First Year of the Panama Canal

In the first fiscal year of the operation of the Panama Canal, from Aug. 15, 1914, to July 1, 1915, 530 vessels passed through it from the Pacific to the Atlantic and 558 went in the opposite direction, making a total of 1088 vessels. These carried an aggregate of 4,969,792 cargo tons. The records show that not one German or Austrian flag used the canal. The receipts for the first year, Aug. 15, 1914, to Aug. 15, 1915, from tolls, was $5,216,149, representing the passage of 1317 ocean-going vessels of a gross tonnage of 6,494,673 and a net tonnage of 4,596,644 tons.

Milliken Brothers, Inc., fabricator and erector of structural steel work, has moved the general and executive offices from the Whitehall Building to the plant at Milliken, Staten Island, but has opened sales offices at 111 Broadway, New York.

W. H. Miller, Pittsburgh, has purchased the plant of the York Bridge Company, York, Pa., for $33,060. The plant had previously been sold to a creditors' committee at private sale for $30,050, but the sale was set aside by the court.

The Colorado Fuel & Iron Company has taken an order for 5000 tons of steel rails for the main line of the Government railroad inland from Seward, Alaska.

The Iron and Metal Markets

RAILROAD BUYING FOR 1916

See Rail Mill Space Going to Bars

Pig Iron Prices and Production Still Advancing —Large Ferromanganese Output

A significant turn in the steel trade is the beginning of rail orders for spring rolling. The Louisville & Nashville has bought 43,000 tons from the Steel Corporation and the Atlantic Coast Line 20,000 tons for such delivery. The New York Central Lines are taking up their next year's requirements and an Eastern road is figuring on rollings before winter for rails it will lay in the spring.

At last the railroads are impressed with the extent to which rail mill space is being taken up with war orders for large rounds. Western lines are seeking to contract at Chicago for track supplies for 1916, but thus far the mills have not quoted for that delivery. About 3000 cars are now up for bids and inquiries for 4000 more are expected.

The steel industry is making new production records. In August the Steel Corporation produced more ingots than in any other month; likewise the independent companies as a whole. The corporation's shipments of finished steel last month were close to 42,000 tons a day. Its statement of unfilled orders is expected to show an increase for August, but only a moderate one in view of the large amount worked off in the month.

Pig-iron output is mounting. In August it was 2,779,647 tons, or 89,666 tons a day, against 2,563,420 tons in July, or 82,691 tons a day. The steel works furnaces increased 5000 tons and the merchant furnaces 2000 tons a day. Steel companies produced 2,101,818 tons of pig iron last month, breaking all records. May, 1913, with 1,991,192 tons, is the nearest month.

On Sept. 1 the capacity of the 249 furnaces in blast was 91,075 tons a day, a rate only exceeded in February and April, 1913. On Aug. 1 the 234 furnaces in blast were making 86,776 tons a day. Furnaces are still wheeling into line, the Steel Corporation blowing in one at Pittsburgh and one at Farrell, Pa., this week. Pig iron production is now at the rate of 33,500,000 tons a year. It was 18,000,000 tons a year on Jan. 1.

Just as comment is renewed on the acute situation that seems to be ahead in ferromanganese, domestic production has risen sharply, the ferro and spiegel total being 27,463 tons in August, against an average of 15,000 tons for the previous months of the year and 28,310 tons in the record month of July, 1913. Steel works depending on British supply are showing more concern. Ore supply is a continuing problem. The Carnegie Steel Company is now paying 45c. a unit, as against 41c. recently paid for Brazilian ore and 26c. as its last official quotation.

The advance in pig iron continues. Bessemer iron has sold at $16 at Valley furnace, and in basic iron while $14.50 was done on a 3000-ton lot last week $14.75 and $15 are now quoted.

Consumers of foundry iron are watching closely the increase in production of merchant iron; but with it there was a reduction in stocks in August, amounting in Alabama to 40,000 tons. At Buffalo the sale of 50,000 tons of basic iron to be delivered as hot metal has reduced the capacity available for foundry iron and the price of the latter has gone to $15 as minimum for fourth quarter delivery.

Most buyers have seen the successive advances in foundry iron without covering for 1916, yet with each week some sales of Northern iron are made for that delivery at advances over this year's prices. Southern makers have booked relatively little for next year, and in the Central West a good many foundries have enough iron bought to carry over into next year.

The scarcity of steel billets has brought prices as high as $26 and $27 at Pittsburgh. Foreign inquiry for billets and blooms is still heavy and this business, like that in large rounds, is bandied about in tens of thousands of tons.

For large round bars 3c. has been paid, and yet 25,000-ton lots are pressing upon the mills. At Cleveland 16,500 tons is wanted for one shrapnel contract, with 16,500 tons to follow.

The domestic merchant trade in a variety of products is a factor in the situation sometimes overlooked. It is enough to hold plate and shape prices more firmly.

The appearance of a new Pittsburgh competitor in the wrought-pipe field is interesting. The proposed Aliquippa mill will not be a producer, however, until July, 1916.

Rumblings of union labor demands in the zinc ore district and the probability of higher spelter are a disturbing factor in all galvanized products.

The scrap market is creeping up again. Heavy melting steel is strong in all districts. At Chicago as high as $12.50 was paid on a 15,000-ton lot.

A Comparison of Prices

Advances Over the Previous Week in Heavy Type. Declines in Italics

At date, one week, one month and one year previous

	Sept 8,	Sept. 1,	Aug. 11,	Sept. 9,
Pig Iron, Per Gross Ton:	1915.	1915.	1915.	1914.
No. 2 X, Philadelphia	**$16.00**	$15.50	$14.75	$14.75
No. 2, Valley furnace	14.50	14.50	13.25	13.00
No. 2 Southern, Cin'ti	13.90	13.90	13.90	13.25
No. 2, Birmingham, Ala.	11.00	11.00	11.00	10.00
No. 2, furnace, Chicago*	13.50	13.50	13.25	13.50
Basic, del'd, eastern Pa.	**17.00**	16.50	15.25	14.00
Basic, Valley furnace	14.50	14.50	14.00	13.00
Bessemer, Pittsburgh	**16.95**	16.45	15.95	14.90
Malleable Bess., Ch'go*	13.50	13.50	13.25	13.25
Gray forge, Pittsburgh	**14.70**	14.45	13.95	13.65
L. S. charcoal, Chicago	*15.75*	16.25	15.75	15.75
Billets, etc. Per Gross Ton:				
Bess. billets, Pittsburgh	**24.00**	23.50	23.00	21.00
O.-h. billets, Pittsburgh	**24.50**	24.00	23.50	21.00
O.-h. sheet bars, P'gh	**25.00**	24.50	24.00	22.00
Forging billets, base, P'gh	**32.00**	30.00	28.00	26.00
O.-h. billets, Phila	32.00	32.00	30.00	23.40
Wire rods, Pittsburgh	**29.00**	28.00	27.00	26.50
Finished Iron and Steel,				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Bess. rails, heavy, at mill	1.25	1.25	1.25	1.25
Iron bars, Philadelphia	1.459	1.459	1.40	1.15
Iron bars, Pittsburgh	1.35	1.35	1.30	1.20
Iron bars, Chicago	1.25	1.25	1.20	1.07½
Steel bars, Pittsburgh	**1.35**	1.30	1.30	1.20
Steel bars, New York	1.519	1.519	1.469	1.36
Tank plates, Pittsburgh	**1.35**	1.30	1.25	1.20
Tank plates, New York	1.519	1.519	1.419	1.36
Beams, etc., Pittsburgh	1.35	1.35	1.30	1.20
Beams, etc., New York	1.519	1.519	1.469	1.36
Skelp, grooved steel, P'gh	1.30	1.30	1.25	1.20
Skelp, sheared steel, P'gh	1.35	1.35	1.30	1.25
Steel hoops, Pittsburgh	1.35	1.35	1.30	1.30

*The average switching charge for delivery to foundries in the Chicago district is 50c. per ton.

Sheets, Nails and Wire,	Sept 8, 1915.	Sept. 1, 1915.	Aug. 11, 1915.	Sept. 9, 1914.
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, P'gh.	1.90	1.90	1.85	1.95
Galv. sheets, No. 28, P'gh.	3.60	3.60	3.85	2.95
Wire nails, Pittsburgh	1.65	1.65	1.60	1.60
Cut nails, Pittsburgh	1.60	1.60	1.60	1.60
Fence wire, base, P'gh	1.50	1.50	1.40	1.40
Barb wire, galv., P'gh	2.50	2.50	2.50	2.00
Old Material, Per Gross Ton:				
Iron rails, Chicago	**13.50**	$12.25	$12.25	$12.00
Iron rails, Philadelphia	**18.50**	18.00	15.50	14.00
Carwheels, Chicago	11.75	11.75	11.50	11.25
Carwheels, Philadelphia	**14.00**	13.50	13.00	11.50
Heavy steel scrap, P'gh	**14.50**	14.00	14.00	11.25
Heavy steel scrap, Phila.	**15.00**	14.25	13.50	11.00
Heavy steel scrap, Ch'go	11.75	11.75	11.50	9.50
No. 1 cast, Pittsburgh	13.00	13.00	12.50	11.50
No. 1 cast, Philadelphia	14.00	14.00	13.00	12.00
No. 1 cast, Ch'go (net ton)	10.00	10.00	9.50	9.25
Coke, Connellsville,				
Per Net Ton at Oven:				
Furnace coke, prompt	$1.50	$1.50	$1.50	$1.65
Furnace coke, future	1.75	1.75	1.75	1.75
Foundry coke, prompt	2.00	2.00	2.00	2.10
Foundry coke, future	2.25	2.25	2.25	2.25
Metals.				
Per Lb. to Large Buyers:	Cents.	Cents.	Cents.	Cents.
Lake copper, New York	18.00	18.00	20.00	13.00
Electrolytic copper, N. Y.	*17.50*	17.75	17.75	12.25
Spelter, St. Louis	*14.25*	16.00	14.00	5.65
Spelter, New York	*14.50*	16.25	14.25	5.80
Lead, St. Louis	4.75	4.75	4.40	3.72½
Lead, New York	4.90	4.90	4.50	3.87½
Tin, New York	*33.25*	33.50	34.62½	33.75
Antimony, Asiatic, N. Y.	28.00	28.00	33.50	10.50
Tin plate, 100-lb. box, P'gh	$3.15	$3.15	$3.10	$3.40

Finished Iron and Steel f. o. b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16.9c.; Philadelphia, 15.9c.; Boston, 18.9c.; Buffalo, 11.6c.; Cleveland, 10.5c.; Cincinnati, 15.8c.; Indianapolis, 17.9c.; Chicago, 18.9c.; St. Louis, 23.6c.; Kansas City, 43.6c.; Omaha, 43.6c.; St. Paul, 32.9c.; Denver, 68.6c.; New Orleans, 30c.; Birmingham, Ala., 45c.; Pacific coast, 75c., on plates, structural shapes and sheets and 65c. on wrought pipe and boiler tubes. The foregoing rates to the Pacific coast are by rail. The rate via New York and the Panama Canal is 58.9c.

Plates.—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.35c. base net cash, thirty days. Following are stipulations prescribed by manufacturers:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated Feb. 6, 1903, or equivalent, ¼ in. and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per sq. ft., are considered ¼-in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge or not less than 11 lb. per sq. ft., to take base price. Plates over 72 in. wide ordered less than 11 lb. per sq. ft. down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gage or weight to be governed by the standard specifications of the Association of American Steel Manufacturers.

Extras	Cents per lb.
Gages under ¼ in. to and including 3-16 in.	.10
Gages under 3-16 in. to and including No. 8	.15
Gages under No. 8 to and including No. 9	.25
Gages under No. 9 to and including No. 10	.30
Gages under No. 10 to and including No. 12	.40
Sketches (including straight taper plates), 3 ft. and over	.10
Complete circles, 3 ft. in diameter and over	.20
Boiler and flange steel	.10
"A. B. M. A." and ordinary firebox steel	.20
Still bottom steel	.30
Marine steel	.40
Locomotive firebox steel	.50
Widths over 100 in. up to 110 in., inclusive	.05
Widths over 110 in. up to 115 in., inclusive	.10
Widths over 115 in. up to 120 in., inclusive	.15
Widths over 120 in. up to 125 in., inclusive	.25
Widths over 125 in. up to 130 in., inclusive	.50
Widths over 130 in.	1.00
Cutting to lengths under 3 ft. to 2 ft., inclusive	.25
Cutting to lengths under 2 ft. to 1 ft., inclusive	.50
Cutting to lengths under 1 ft.	1.55

No charge for cutting rectangular plates to lengths 3 ft. and over.

Wire Products.—Prices to jobbers, in effect from Aug. 23: Fence wire, Nos. 0 to 9, per 100 lb., terms sixty days or 2 per cent discount in ten days, carload lots, annealed, $1.50; galvanized, $2.20. Galvanized barb wire and staples, $2.50; painted, $1.80. Wire nails, $1.65. Galvanized nails, 1 in. and longer, $1.75 advance over base price; shorter than 1 in., $2.25 advance over base price. Woven wire fencing, 71½ per cent off list for carloads, 70½ off for 1000-rod lots; 69½ off for less than 1000-rod lots.

The following table gives the price to retail merchants on fence wire in less than carloads, with the extras added to the base price:

Plain Wire, per 100 lb.

Nos.	0 to 9	10	11	12&12½	13	14	15	16
Annealed	$1.55	$1.60	$1.65	$1.70	$1.80	$1.90	$2.00	$2.10
Galvanized	2.45	2.50	2.55	2.60	2.70	2.80	3.10	3.20

Wire Rods.—Bessemer, open-hearth and chain rods, $29.

Structural Material.—I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles 3 to 6 in. on one or both legs, ¼ in. thick and over, and zees 3 in. and over, 1.35c. Extras on other shapes and sizes are as follows:

	Cents per lb.
I-beams over 15 in.	.10
H-beams over 18 in.	.10
Angles over 6 in., on one or both legs	.10
Angles, 3 in. on one or both legs less than ¼ in. thick, as per steel bar card, Sept. 1, 1909	.70
Tees, structural sizes (except elevator, handrail, car truck and conductor rail)	.05
Channels and tees, under 3 in. wide, as per steel bar card, Sept. 1, 1909	.20 to .80
Deck beams and bulb angles	.30
Handrail tees	.75
Cutting to lengths under 3 ft., to 2 ft. inclusive	.25
Cutting to lengths, under 2 ft., to 1 ft. inclusive	.50
Cutting to lengths, under 1 ft.	1.55

No charge for cutting to lengths 3 ft. and over.

Wrought Pipe.—The following are the jobbers' carload discounts on the Pittsburgh basing card in effect from Aug. 16, 1915, all full weight:

Butt Weld

Steel			Iron		
Inches	Black	Galv.	Inches	Black	Galv.
⅛, ¼ and ⅜	72	46½	⅛ and ¼	64	37
½	76	59½	⅜	64	37
¾ to 3	79	63½	½	68	47
			¾ to 2½	71	52

Lap Weld

2	76	60½	1¼	55	36
2½ to 6	78	62½	1½	66	47
7 to 12	76	58½	2	67	49
13 and 14	62½	..	2½ to 4	69	52
15	60	..	4½ to 6	69	52
			7 to 12	67	50

Reamed and Drifted

1 to 3, butt	77	61½	1 to 1½, butt	69	50
2, lap	74	58½	2, butt	69	50
2½ to 6, lap	76	60½	1¼, lap	53	34
			1½, lap	64	45
			2, lap	65	47
			2½ to 4, lap	67	50

Butt Weld, extra strong, plain ends

⅛, ¼ and ⅜	67	49½	⅜	61	43
½	72	58½	½	68	51
¾ to 1½	76	62½	¾ to 1½	70	53
2 to 3	77	63½	2 and 2½	71	54

Lap Weld, extra strong plain ends

2	73	57½	1½	65	48
2½ to 4	75	59½	2	67	49
4½ to 6	74	58½	2½ to 4	69	52
7 to 8	68	50½	4½ to 6	68	51
9 to 12	63	45½	7 to 8	61	44
			9 to 12	56	39

Butt Weld, double extra strong, plain ends

½	62	48½	½	56	40
¾ to 1½	65	51½	¾ to 1½	59	43
2 to 2½	67	53½	2 and 2½	61	45

Lap Weld, double extra strong, plain ends

2	63	49½	2	57	40
2½ to 4	65	51½	2½ to 4	59	45
4½ to 6	64	50½	4½ to 6	58	44
7 to 8	58	40½	7 to 8	51	33

To the large jobbing trade an additional 5 per cent is allowed over the above discounts.

The above discounts are subject to the usual variation in weight of 5 per cent. Prices for less than carloads are two (2) points lower basing (higher price) than the above discounts on black and three (3) points on galvanized.

Boiler Tubes.—Discounts on less than carloads, f.o.b. Pittsburgh, freight to destination added, in effect from July 16, 1915:

Lap Welded Steel		*Standard Charcoal Iron*	
1¾ and 2 in.	63	1¾ and 2 in.	50
2¼ in.	60	2¼ in.	47
2½ to 2¾ in.	66	2½ and 2¾ in.	54
3 and 3¼ in.	71	3 and 3¼ in.	58
3½ and 4½ in.	72	3½ and 4½ in.	60
5 and 6 in.	67	5 and 6 in.	54
7 to 13 in.	62		

Locomotive and steamship special charcoal grades bring higher prices.

1¾ in., over 18 ft., 10 per cent net extra.

2 in. and larger, over 22 ft., 10 per cent net extra.

Sheets.—Makers' prices for mill shipment on sheets of U. S. Standard gage, in carload and larger lots, on which jobbers charge the usual advance for small lots from store, are as follows, f.o.b. Pittsburgh, terms thirty days net, or 2 per cent cash discount in ten days from date of invoice:

Blue Annealed Sheets

	Cents per lb.
Nos. 3 to 8	1.40 to 1.45
Nos. 9 to 10	1.45 to 1.50
Nos. 11 and 12	1.50 to 1.55
Nos. 13 and 14	1.60 to 1.65
Nos. 15 and 16	1.70 to 1.75

Box Annealed Sheets, Cold Rolled

	Cents per lb.
Nos. 10 and 11	1.55
No. 12	1.55
Nos. 13 and 14	1.60
Nos. 15 and 16	1.65
Nos. 17 to 21	1.70
Nos. 22 and 24	1.75
Nos. 25 and 26	1.80
No. 27	1.85
No. 28	1.90
No. 29	1.95
No. 30	2.05

Galvanized Sheets of Black Sheet Gage

	Cents per lb.
Nos. 10 and 11	2.60 to 2.75
No. 12	2.70 to 2.85
Nos. 13 and 14	2.70 to 2.85
Nos. 15 and 16	2.80 to 2.95
Nos. 17 to 21	2.95 to 3.10
Nos. 22 and 24	3.15 to 3.30
Nos. 25 and 26	3.30 to 3.45
No. 27	3.45 to 3.60
No. 28	3.60 to 3.75
No. 29	4.35 to 4.50
No. 30	4.60 to 4.75

Pittsburgh

PITTSBURGH, PA., Sept. 7, 1915.

There is no abatement whatever in the demand for open-hearth steel products, much of it being for war munitions, and the scarcity in supply of open-hearth steel, which has existed for three or four months, is getting worse. Both Bessemer and open-hearth billets for prompt shipment are bringing premiums of $2 to $3 per ton. The local agent of a steel mill outside the Pittsburgh district reports having sold Bessemer billets at close to $29 for spot shipment. In the past week, 15,000 tons of 3¼-in. rounds was placed with a local steel mill through the firm of J. P. Morgan & Co., New York City. Steel rounds for shrapnel purposes are being quoted at 3c. and higher, and it is claimed 3.25c. has been paid. Local steel mills report they are operating to utmost capacity, turning out more steel than ever before in their history, and yet are not able to catch up on deliveries, orders coming in still being in excess of shipments. Everything in the finished lines of steel is very active in demand, with the exception of railroad spikes, chain and black and galvanized sheets. The new demand for plates, shapes and bars is very urgent, especially for steel bars, and the mills are filled up for some weeks ahead. Pig iron is only in moderate demand, but prices are very firm, standard Bessemer having sold in the past week at $16, Valley furnace. There has been a slight lull in scrap, but the market remains firm. There is no let-up in the heavy demand for barb wire for foreign shipment, and local mills are turning away inquiries nearly every day on which they cannot make deliveries wanted. Several steel concerns report that actual orders entered up to Sept. 1, and shipments made, are largely in excess of the entire business they did in all of last year. The present active situation seems fully assured for the next six months at least, and it is not believed that, even if the European war should stop, there would be much, if any, falling off in the present high tide operation of the steel mills.

Pig Iron.—While the active buying of Bessemer and basic iron and also inquiry in the past week have not been as heavy as in the previous two or three weeks, the market has a very strong undertone, prices on Bessemer being higher and actual sales having been made at $16, Valley furnace. Nearly all sellers of basic iron are now quoting $15, and one or two sales of fairly large amounts are expected to be put through within a day or two at about $14.75, Valley furnace. The smaller consumers of Bessemer and basic iron are pretty heavily covered over the next two or three months, but signs point to some of the large steel companies buying both Bessemer and basic iron within a short time. Present melting of both Bessemer and basic iron is enormously heavy and the stocks of pig iron accumulated by the steel companies before the steel trade became so active are being steadily drawn upon and are now nearly exhausted. Any large buying of Bessemer and basic iron would no doubt quickly send prices up 50c. per ton or more. We note sales of three lots of Bessemer iron amounting to 5000 tons at $16, Valley furnace, and this price is now minimum of the market. We also note sales of 7000 tons of Bessemer iron for foreign shipment at the same price. Of this 400 tons is to be shipped out this week to Italy, and the demand from that country for Bessemer iron is quite urgent, this making upward of 25,000 tons shipped there by a Sharpsville furnace interest. We also note a sale of 3000 tons of basic iron made last week at $14.50 at Valley furnace, but it is hardly likely any more iron could be secured at this price. The demand for foundry iron is fairly active and prices are very firm. We note a sale of 600 tons of No. 2, equal deliveries in last quarter of this year at $14.75, and 1200 tons, half for delivery in last quarter and half for first quarter, at $15, Valley furnace. A sale of 2000 tons of forge iron is reported at $13.75, Valley furnace. We quote: Standard Bessemer iron, $16; basic, $14.50 to $14.75; malleable Bessemer, $14.50 to $14.75; Gary forge, $13.75 to $14, and No. 2 foundry, $14.75 to $15, all at Valley furnace, the freight for delivery in the Cleveland or Pittsburgh district being 95c. per ton. W. P. Snyder & Co., Oliver Building, Pittsburgh, report the average price of Bessemer iron in August to have been $15.064, and of basic, $14.364, per gross ton, both f.o.b. cars at Valley furnace. In Bessemer iron this was an increase over July of $1.073, and basic, $1.405 per ton. These prices are based on sales of Bessemer and basic of 1000 tons or over.

Billets and Sheet Bars.—While new inquiry for sheet bars is quiet, there is an urgent demand for both Bessemer and open-hearth billets and premiums of as high as $2 per ton have been paid over regular prices for prompt delivery. It is confirmed that a Youngstown steel interest has taken a foreign order for 50,000 tons of steel rounds which are to be machined by a Youngstown interest, and another Youngstown steel mill is credited with having taken 40,000 tons of open-hearth steel billets for shipment to France. Sales of Bessemer and open-hearth billets for prompt delivery have been made at $26 and $27, but these prices are regarded as above the regular market, which is about $25, Youngstown or Pittsburgh. Prices on forging billets are higher, sales having been made of ordinary carbon at $33, Pittsburgh. High carbon forging billets have sold up to $37 in small lots for prompt shipment. It is difficult to quote the market on steel, as consumers who have to come in and buy are willing to pay almost any price to get prompt deliveries. We quote: Bessemer billets, $24; open-hearth billets, $24.50; Bessemer sheet bars, $25, and open-hearth sheet bars, $25.50, Youngstown; Bessemer billets, $24; open-hearth billets, $24.50; Bessemer sheet bars, $25.50, and open-hearth sheet bars, $26, f.o.b., Pittsburgh mill. We quote forging billets at $31 to $33 for sizes up to but not including 10 x 10 in., and for carbons up to 0.25, the regular extras being charged for larger sizes and higher carbons. Forging billets running above 0.25 and up to 0.60 carbon take $1 per ton extra. Axle billets are held at $28 to $29.

Ferroalloys.—New demand for ferromanganese is more active than for some time, and this is taken to mean that stocks held by the steel mills and other users are getting low and they are getting more anxious about a future supply. It is said that occasionally when a cargo of English ferromanganese reaches seaboard, some of it is removed and shipped out on new orders for prompt delivery, and for which as high as $110 or more, seaboard, is paid. In this way consumers who have contracts placed long ago are not getting the full amount of their shipment, and it is said this practice is getting more frequent. Domestic

80 per cent ferromanganese, some of it made in Dunbar, Pa., can be had at $110 to $112.50, Pittsburgh, in carload and larger lots. We note a sale of one car of domestic 80 per cent last week at $111.50, delivered. There has been another advance in prices of Bessemer ferrosilicon, which is now very firm, as follows: 10 per cent, $20; 11 per cent, $21; 12 per cent, $22; 13 per cent, $23, and 14 per cent, $24, all f.o.b. cars at furnace, Ashland, Ky., New Straitsville, Ohio, or Jackson, Ohio, each of these points having a freight rate of $2 per gross ton to Pittsburgh. We quote 20 per cent spiegeleisen at $27, at furnace. We note a sale of 2000 tons of 14 per cent Bessemer ferrosilicon at $25 at furnace, equal monthly deliveries over the first half of 1916. We quote ferrotitanium at 8c. per pound in carloads, 10c. in 2000-lb. lots and over, and 12½c. in smaller lots. We quote ferrovanadium at $2 to $2.25 per pound of contained vanadium, prices depending somewhat on the size of the order.

Structural Material.—Local inquiry in the past week was very dull and no large jobs are in sight in this district. Golden & Crick, this city, have the general contract for the Bailey high school to be erected on the South Hills, Pittsburgh, at a cost of $224,008, and the steel, about 700 tons, has been placed with a local interest. The Riter-Conley Mfg. Company has taken 1000 tons for additions to the plant of the Trumbull Steel Company, Warren, Ohio. Prices are very firm and we quote beams and channels up to 15 in. at 1.35c., f.o.b., Pittsburgh.

Plates.—There is no new buying of steel cars by the railroads and inquiries are very scarce. The New York Central is in the market for 1000 miscellaneous cars on which the steel car companies are now figuring. Prices are firm and we quote ¼-in. and heavier plates at 1.35c., f.o.b., Pittsburgh. It is possible that on a very desirable specification this price might be shaded $1 per ton by a few mills. The Riter-Conley Mfg. Company has taken a contract for one mile of 24-in. steel dredge pipe for the St. Lawrence River Power Company. The plates are to be furnished by a local mill.

Steel Rails.—New inquiry for standard sections is only for very small lots for prompt shipment. The steel mills are not worried over the fact that the railroads are not placing large orders for rails, as under present war conditions they can divert steel that would ordinarily be used in making steel rails to other products, on which there is a much larger profit. New inquiry for light rails is active, the Carnegie Steel Company having received new orders and specifications in the past week for about 3100 tons. This company reports new inquiry for steel ties as quite active. We quote standard sections rails of Bessemer stock at 1.25c., and of open-hearth, 1.34c., f.o.b. Pittsburgh. We quote light rails as follows, in carload lots: 8 and 10-lb. sections, 1.275c.; 12 and 14-lb., 1.225c.; 16 and 20-lb., 1.175c.; 25, 30, 35, 40 and 45-lb. sections, 1.125c. The prices of light rails are materially shaded on large lots.

Tin Plate.—Conditions in the tin-plate trade are quieting down, due to a falling off in specifications, but the situation is being helped out by the heavy foreign inquiry. Regular shipments of tin plate are being made by local mills to Asia and South America, and there is also inquiry from France and England. Several mills report they have specifications ahead on contracts for tin plate for two or three weeks, but unless there is heavier specifying in the near future they will have to cut down operations. It is said that domestic prices or higher are being obtained on tin plate for export. Due to the higher prices on steel, prices on tin plate are very firm, and we quote 14 x 20 coke plates for domestic trade at $3.15 to $3.25, per base box, f.o.b. Pittsburgh.

Sheets.—A feature of the market is the heavy demand for sheets from the electrical companies and which ultimately find their way into war materials in one shape or another. A contract for 5000 tons of electrical sheets was placed with a local interest last week, and another mill reports an order for 3000 tons of electrical sheets. High prices are being paid and this branch of the sheet trade is very profitable. The new demand for blue annealed sheets is quite active, and it is said the recent advance in prices is holding firm. There is only a moderate demand for Bessemer black sheets, and in galvanized there is very little doing, as consumers are not inclined to buy ahead, as they fear prices of spelter may go off again, resulting in a lower market on galvanized sheets. The sheet mills are operating all the way from about 75 per cent to 100 per cent of capacity in some cases. We quote No. 28 galvanized sheets at 3.60c. to 3.75c.; No. 28 Bessemer black sheets, 1.90c.; Nos. 9 and 10 blue annealed, 1.45c. to 1.50c.; No. 30 black plate, tin-mill sizes, H. R. & A., 1.95c.; No. 28, 1.90c.; Nos. 27, 26 and 25, 1.85c.; Nos. 22 to 24, 1.80c.; Nos. 17 to 21, 1.75c.; Nos. 15 and 16, 1.70c. The above prices are for carload lots, f.o.b. at maker's mill, jobbers charging the usual advances for small lots from store.

Wire Rods.—There is a great scarcity in supply of wire rods, and mills that can make deliveries can obtain high prices. It is said that as high as $30 has been paid for both Bessemer and open-hearth rods for prompt shipment, but this is a little above the regular market. We quote Bessemer, open-hearth and chain rods at $29, f.o.b. Pittsburgh, and for forward delivery as high as $30 is being quoted.

Wire Products.—The domestic demand for wire nails is only fair, as the mills still have some contracts taken at $1.55 and more at $1.60, against which specifications are coming in at a moderate rate. The foreign demand for barb wire continues enormously heavy and every day foreign inquiries are put up to local wire mills on which they cannot quote and make the deliveries wanted. It is said that at the present time there are bona fide inquiries in the market for about 200,000 tons of galvanized and painted barb wire, mostly for the former. The high prices ruling on fence wire are expected to restrict the consumption this fall, but the wire mills will not suffer on this account as they can sell all the barb wire abroad that they can make. Prices to the large trade are as follows: Wire nails, $1.65; galvanized nails 1 in. and longer taking an advance over this price of $1.75, and shorter than 1 in. $2.25. Plain annealed wire is $1.50; galvanized barb wire and fence staples, $2.50; painted barb wire, $1.80; polished fence staples, $1.80, all f.o.b. Pittsburgh, with freight added to point of delivery, terms sixty days net, less 2 per cent off for cash in ten lays. Prices on woven wire fencing are 71½ per cent off in carload lots, 70½ per cent on 1000-rod lots, and 69½ per cent on small lots, f.o.b., Pittsburgh.

Cold-Rolled Strip Steel.—While nearly all consumers of cold-rolled strip steel have covered their needs over the remainder of this year, there is still a fair demand for small lots and foreign inquiry is fairly active. All the plants making cold-rolled strip steel are operating to full capacity and have their product sold ahead for some months. The base price is firm at $3 per 100 lb., delivered, but to regular customers on desirable orders this price might be slightly shaded. We quote hard-rolled steel, 1½ in. and wider, under 0.20 carbon, sheared or natural mill edge, per 100 lb., $3 delivered. Extras, which are standard among all mills, are as follows:

Thickness, in.	Extras for thickness	Extras for soft or intermediate tempers	Extras for straightening and cutting to lengths not less than 24 in.
0.100 and heavier	Base	$0.25	$0.10
0.099 to 0.050	$0.05	0.25	0.15
0.049 to 0.035	0.20	0.25	0.15
0.034 to 0.031	0.35	0.40	0.25
0.030 to 0.025	0.45	0.40	0.40
0.024 to 0.020	0.55	0.40	0.50
0.019 to 0.017	0.85	0.50	1.10
0.016 to 0.015	1.25	0.50	1.10
0.014 to 0.013	1.95	0.50	1.25
0.012	2.30	0.50	coils only
0.011	2.65	0.50	coils only
0.010	3.00	0.50	coils only

Skelp.—New inquiry is light, but the mills have a fair amount of work ahead and prices are firm. We quote grooved steel skelp at 1.30c. to 1.35c.; sheared steel skelp, 1.35c. to 1.40c.; grooved iron skelp, 1.70c. to 1.75c., and sheared iron skelp, 1.80c. to 1.85c., delivered to consumers' mills in the Pittsburgh district.

Railroad Spikes.—The new demand is very dull and railroads that placed large contracts for spikes early in the year are not specifying, with the result that the spike trade is very quiet, and the outlook for the remainder of the year is not very encouraging. One concern closed its spike mill for a week recently for lack of orders. We quote standard sizes of railroad spikes at $1.50, and small railroad and boat spikes at $1.60 per 100 lb., f.o.b., Pittsburgh.

Rivets.—The domestic demand is very active and there is a good deal of foreign inquiry, local makers of rivets making regular shipments to China, Japan, South America and other countries. Several makers state they have their output practically sold up for the remainder of this year. We quote buttonhead structural rivets at $1.65 to $1.70 and conehead boiler rivets at $1.75 to $1.80 in large lots, per 100 lb., f.o.b., Pittsburgh, smaller lots bringing about 10c. advance.

Hoops, Bands and Cotton Ties.—There is not much new buying in hoops and bands for the reason that consumers are covered over the remainder of the year, but specifications are very active and the mills are falling behind in deliveries. Prices on both steel hoops and bands are slightly higher. We quote steel hoops at 1.35c. to 1.40c.; bands, 1.35c., extras as per the steel bar card for delivery over the remainder of the year. Cotton ties are quoted at 86c. per bundle for delivery this month.

Iron and Steel Bars.—There is no end to the inquiries coming up for steel rounds for shrapnel, one local mill having taken an order in the past week for 15,000 tons, for which it is said very close to 3c. was obtained. The new demand for steel bars is very heavy and specifications are active. The steel-bar mills are working to utmost capacity, turning out more product than ever before in their history, but are behind in deliveries on some sizes from six to eight weeks. No quotation less than 1.35c. is now being named on steel bars, and there have been several sales of moderate quantities for first quarter of 1916 at 1.40c., Pittsburgh. The new demand for common iron bars and for steel bars for reinforcing purposes is heavier than for some time. We quote steel bars at 1.35c. for delivery over remainder of the year; refined iron bars, 1.40c. to 1.45c.; common iron bars, 1.35c., and railroad test iron bars, 1.45c. to 1.50c., all f.o.b., Pittsburgh.

Carwheels.—Local makers have their entire output of steel carwheels sold up over remainder of this year, and prices are very firm. We quote standard 33-in. freight carwheels, 6¼-in. rough bore, at $16, and standard 36-in. passenger, the same bore, at $22.50 per wheel, f.o.b., Pittsburgh.

Nuts and Bolts.—Domestic demand is active and there is a heavy foreign inquiry, regular shipments abroad being made by local makers and for which higher prices are usually obtained than domestic orders. An advance in prices of nuts and bolts is looked for at any time. Discounts to the large trade are as follows:

U. S. S. Cold Punched Blank and Tapped, Chamfered, Trimmed and Reamed

½ in. and smaller, hex.....7.4c. per lb. off
⅝ in. and larger, hex.....6.9c. per lb. off
Square, all sizes.....5.5c. per lb. off

Semi-Finished Tapped

½ in. and smaller, hex.....85-10-5 off
⅝ in. and larger, hex.....85-5 off

Black Bolt Rivets

7/16 x 6½, smaller and shorter.....80-10 off

Package Rivets, 1000 Pcs.

Black, metallic tinned and tin plated....75-10-10 off

Discounts on bolts to the large trade are as follows:

Machine bolts, h. p. nuts, ⅜ x 4 in., smaller and shorter, rolled, 75, 10, 10 & 10; smaller and shorter, cut, 75, 10, 10 & 5; larger or longer, 75 & 10. Machine bolts, C. P. C. & T. nuts, ⅜ x 4 in., smaller and shorter, 75, 10 & 7½; larger or longer, 70, 10 & 7½. Common carriage bolts, ⅜ x 6 in., smaller and shorter, rolled, 75, 10, 10 & 5; smaller and shorter, cut, 75, 10 & 10; larger or longer, 75 & 5. Bolts without nuts, 6 in. and shorter, extra 10; longer lengths, extra, 5. Blank bolts, 75 & 10. Bolt ends with h. p. nuts, 75 & 10; C. P. C. & T. nuts, 70, 10 & 7½. Gimlet point coach screws and cone point lag screws, 80 & 15. Nuts, blank or tapped, h. p. square, 6c. lb. off; h. p. hexagon, 6.70c. lb. off; C. P. C. & T. square, 5.50c. lb. off; hexagon, ⅝ in. and up, 7c. lb. off; smaller, 7.50c. lb. off; C. P. plain, square, 5.40c. lb. off; hexagon, 5.80c. lb. off; C. P. semi-finished, hexagon, ⅝ in. and up, 85 & 10; smaller, 85, 10 & 10.

Shafting.—This trade is very active and as an indication of the strength in prices, we can state that several fairly large orders for shafting for delivery in first quarter of 1916 have been placed at one point lower discount, equal to an advance of $2 per ton, over prices quoted for remainder of the year. The demand from the screw stock concerns, also from automobile builders, is enormously heavy and the makers of shafting are well sold up for the remainder of this year. A good deal of shafting is finding its way into war materials of various kinds and this is serving to intensify the demand. Prices are very firm and another advance is expected.

Merchant Steel.—Mills report that demand very active and specifications against orders are heavy. Shipments in August were heavier than in any one month for over two years and are expected to be fully as large this month. Prices are very strong, but no higher, and on small lots are as follows: On small lots we quote: Iron finished tire, ½ x 1½ in. and larger, 1.60c. base; under ½ x 1½ in., 1.75c.; planished tire, 1.80c.; channel tire, ¾ to ⅞ and 1 in., 2.10c. to 2.20c.; 1 x ⅛ in. and larger, 2.20c.; toe calk, 2.20c. to 2.30c. base; flat sleigh shoe, 1.95c.; concave and convex, 2c.; cutter shoe, tapered or bent, 2.50c. to 2.60c.; spring steel, 2.20c. to 2.30c.; machinery steel, smooth finish, 2c.

Wrought Pipe.—As indicated in this report last week, another large steel pipe mill is to be built in the Pittsburgh district. The Jones & Laughlin Steel Company has placed contracts for the building of two lap and two butt weld furnaces, also a large skelp mill at Aliquippa, Pa., and will make all sizes of black and galvanized steel pipe from ¼-in. up to 16 in., inclusive. The new mill will not be a factor in the pipe market before July, 1916. The new demand for merchant pipe and also for oil country goods is dull, but a revival in demand for oil country supplies is looked for later in the year on account of the advances in prices of crude oil. It is not believed now that the intended order of the J. G. White Corporation of New York for 120 miles of 8-in. pipe will be placed. This line was to have been laid in the Cushing oil fields in Oklahoma, but it is said these fields are rapidly being exhausted. The East Ohio Gas Company contemplates laying a natural gas line from Youngstown to Canton, Ohio, and the company has placed an option with the Youngstown Sheet & Tube Company for 50 miles of 14-in. pipe, amounting to about 8000 tons. It is likely the contract will be definitely placed in a short time. Discounts on both black and galvanized iron and steel pipe are shaded more or less, depending on the order.

Boiler Tubes.—New demand for both locomotive and merchant tubes is quiet, particularly for boiler tubes, as the locomotive shops are not very busy. Discounts continue to be more or less shaded.

Coke.—There are no inquiries for blast furnace coke on contracts and new demand for prompt shipment is also very dull. It is evident that by-product coke is going to make more inroads into the consumption of beehive coke, as a Youngstown blast furnace interest is now negotiating for the erection of 100 or more by-product ovens. We quote standard makes of blast-furnace coke at $1.50 to $1.60 for prompt shipment, and $1.75 to $1.85 on contracts for the remainder of the year; standard makes of 72-hr. foundry coke, $2 to $2.25 for prompt delivery and $2.25 to $2.50 on contracts for remainder of the year, all per net ton at oven. The Connellsville *Courier* reports the output of coke in the upper and lower Connellsville regions for the week ended Aug. 28, as 391,310 net tons, an increase over the previous week of 8704 tons.

Old Material.—There is a lull in the demand for scrap, consumers being pretty well covered for some time ahead and evidently waiting to see whether the higher prices will hold. Steel scrap is dull, but there has been quite an active demand for low phosphorus melting stock, which is used largely by concerns making war munitions. There is also a moderate demand for borings and turnings. While the general demand for scrap is not active, prices are holding fairly firm. It is evident that surplus stocks of scrap are held by dealers who can afford to wait until the demand im-

proves, rather than offer material at lower prices. We note sales of 2500 to 3000 tons of low phosphorus melting stock at $18.50 or higher; 1000 tons of borings at $9.75; 500 tons of turnings at $8.75, and three or four lots of selected heavy steel scrap at $14.50 to $15, delivered to consumers' mills in the Pittsburgh district. Prices on low phosporous melting stock are up fully $1 per ton, and on selected heavy steel scrap, about 50c. per ton. Dealers quote for delivery in the Pittsburgh and nearby districts that take the same rates of freight, as follows, per gross ton:

Heavy steel melting scrap, Steubenville, Follansbee, Brackenridge, Sharon, Monessen, Midland and Pittsburgh delivery	$14.50 to $15.00
Compressed side and end sheet scrap	13.00 to 13.25
No. 1 foundry cast	13.00 to 13.25
Bundled sheet scrap, f.o.b. consumers' mills, Pittsburgh district	11.75 to 12.00
Rerolling rails, Newark and Cambridge, Ohio, Cumberland, Md., and Franklin, Pa.	14.25 to 14.50
No. 1 railroad malleable stock	12.25 to 12.50
Railroad grate bars	8.75 to 9.00
Low phosphorus melting stock	18.50 to 19.00
Iron car axles	18.50 to 19.00
Steel car axles	16.00 to 16.50
Locomotive axles, steel	19.75 to 20.25
No. 1 busheling scrap	11.75 to 12.00
No. 2 busheling scrap	8.75 to 9.00
Machine shop turnings	8.75 to 9.00
Old carwheels	13.00 to 13.50
Cast-iron borings	9.50 to 9.75
*Sheet bar crop ends	13.50 to 14.00
Old iron rails	12.75 to 13.00
No. 1 railroad wrought scrap	13.00 to 13.25
Heavy steel axle turnings	10.25 to 10.50
Heavy breakable cast scrap	12.50 to 12.75

*Shipping point.

Chicago

CHICAGO, ILL., Sept. 8, 1915.—(*By Wire.*)

Contracts covering many thousand tons of ammunition rounds, for the protection of which guarantees are to be made by Sept. 10, offer every prospect of becoming effective. It is stated that the tonnage thus involved exceeds the total previously placed in this territory several times. For Russia an additional 19,000 tons of rails has been taken. Sales in August fell below the record of July, but specifications and shipments represent capacity operation. Inquiry covering track fastenings for 1916 from a number of the railroads appeared last week but it is understood that the mills have not yet made quotations. Prices for the principal steel products appear firmer on the basis of 1.35c., Pittsburgh, than at any of the lower levels previously reached in the advance. Even with respect to plates the market is stronger. Activity in the pig-iron market is tapering off somewhat as the average level of quotations gradually advances. Through all of last week $13.50 could still be done for Northern foundry iron. There is very little trading in scrap, and the tendency is in the direction of somewhat lower prices.

Pig Iron.—Notwithstanding all the Lake furnaces are now in a fairly comfortable situation for the remander of this year, competition for the business offering last week was sufficiently keen to prevent a general advance to the prices some interests sought to establish. The greater portion of the Northern iron sold went on the basis of $13.50 at furnace for last quarter delivery. This week it would appear that concessions from the basis of $14 at the furnace will be fewer in number and magnitude. One interest has put its price on the basis of $14.25, with an added premium for next year. A round tonnage of Southern iron was placed at $11.50, Birmingham, but the market now seems to have moved up 25 to 50c. per ton. It appears with respect to charcoal iron prices that at least two sellers are continuing to move their product on the basis of $14 at furnace, although the leading interests are firmly maintaining their quotation at $1 advance. The Thomas furnace at Milwaukee has been blown in on low phosphorus iron, a second Iroquois furnace is going in this week and preparations are under way for blowing in the Manistique furnace on charcoal iron. Of the inquiry still open, 2000 tons of foundry iron for Chicago delivery and 1000 tons for Rockford are the principal items. The following quotations are for iron delivered at consumers' yards, except those for Northern foundry, malleable Bessemer and basic iron, which are f.o.b. furnace, and do not include a switching charge averaging 50c. a ton:

Lake Superior charcoal, Nos. 2 to 5	$15.75 to $16.25
Lake Superior charcoal, No. 1	16.25 to 16.75
Lake Superior charcoal, No. 6 and Scotch	16.75 to 17.25
Northern coke foundry, No. 1	14.00 to 14.50
Northern coke foundry, No. 2	13.50 to 14.00
Northern coke foundry, No. 3	13.25 to 13.50
Southern coke, No. 1 f'dry and 1 soft	16.00 to 16.50
Southern coke, No. 2 f'dry and 2 soft	15.50 to 16.00
Malleable Bessemer	13.50 to 14.00
Standard Bessemer	17.25
Basic	13.25 to 13.75
Low phosphorus	24.00 to 24.50
Silvery, 8 per cent	19.50 to 19.75
Silvery, 10 per cent	20.00 to 20.25

Rails and Track Supplies.—An order has been placed for the Russian Government for an additional 19,000 tons of rails to be rolled at Chicago, bringing the total placed here to approximately 60,000 tons. Domestic rail orders are limited to a few miscellaneous contracts of no consequence. Of particular interest is the inquiry from several railroads regarding their track fastening requirements for 1916, but it is understood that the mills have not yet determined what their position will be in quoting upon this business. We quote standard railroad spikes at 1.65c., base; track bolts with square nuts, 2.05c. to 2.10c., base, all in carload lots, Chicago; tie plates, $30, f.o.b. mill, net ton; standard section Bessemer rails, Chicago, 1.25c., base, open hearth, 1.34c.; light rails, 25 to 45 lb., 1.07c.; 16 to 20 lb., 1.12c.; 12 lb., 1.17c.; 8 lb., 1.22c.; angle bars, 1.50c., Chicago.

Structural Material.—With a steady improvement in the amount of work being booked by fabricators—business which consists almost entirely of small jobs—it is becoming possible to secure prices for fabricated steel in which there it at least a small profit. New car business is quite limited, recent orders including 200 all-steel cars, 200 center sills, and 100 standard freight cars. The principal contract for fabricated work covers material for additions to the Overland warehouses at St. Paul, amounting to 860 tons, taken by the American Bridge Company. At San Francisco a court house, requiring 350 tons, was closed by Dyer Brothers. Except for mill shipment orders, which are still being handled by the jobbers on the basis of 1.30c., Pittsburgh, the market on plain shapes from mill is quotable at 1.539c., Chicago.

Orders for steel out of store are growing steadily in aggregate tonnage. It is the expectation that the 1.30c., Pittsburgh, basis on which jobbers are still accepting orders for mill shipment, will be withdrawn this week, to be followed by an advance of $1 per ton. For structural steel out of stock we quote 1.75c., Chicago.

Plates.—The disposition of a number of smaller plate mills to take advantage of the general scarcity of steel and the beginning of an overflow of Eastern plate business to the mills of the Central West is shown in an advance of their quotations to the basis of 1.35c., Pittsburgh, for prompt delivery. While this price only carries plates to the level of shapes and bars, it has some of the aspects of a premium as compared with quotations of 1.25c. and 1.30c., which are still obtainable. We quote for Chicago delivery of plates from mill 1.439c. to 1.539c.

We quote for Chicago delivery of plates out of stock 1.85c.

Sheets.—For special finish black sheets there has been a fairly good demand and sales of 1000 tons last week on the basis of 2c., Pittsburgh, are noted. For ordinary black sheets, 1.90c., Pittsburgh, appears to be well maintained. There is very little interest in galvanized sheets and the price generally quoted is 3.75c., Pittsburgh. We quote for Chicago delivery from mill, No. 10 blue annealed, 1.589c. to 1.639c.; No. 28 black, 2.089c.; No. 28 galvanized, 3.939c.

We quote for Chicago delivery from jobbers' stock as follows, minimum prices applying on bundles of 25 or more: No. 10 blue annealed, 2.05c.; No. 28 black, 2.55c. to 2.65c.; No. 28 galvanized, 4.35c.

Bars.—The expected putting into effect of contracts already signed for large tonnages of shrapnel bars involves the largest quantities of steel now under consideration in this market, and if made effective by financial guarantees will absorb a considerable proportion of local structural and rail mill capacity during the next

six months. Local merchant mills, which are largely operating on the orders of regular customers, have practically enough tonnage of this sort to round out the year. There is a slightly better offering of iron bars, and the quotation of 1.25c. seems to be quite generally maintained. We quote mill shipment, Chicago, as follows: Bar iron, 1.25c.; soft steel bars, 1.539c.; hard steel bars, 1.30c. to 1.35c.; shafting, in carloads, 65 per cent off; less than carloads, 60 per cent off.

We quote store prices for Chicago delivery: Soft steel bars, 1.75c.; bar iron, 1.75c.; reinforcing bars, 1.75c. base, with 5c. extra for twisting in sizes ½ in. and over and usual card extras for smaller sizes; shafting 54 per cent off.

Rivets and Bolts.—While some local makers of rivets have advanced their quotation to 1.85c., such business as is being placed is at prices $1 per ton lower. Of new business in bolts and nuts there is but little, but specifications are generally up to full contract quotas. We quote as follows: Carriage bolts up to ⅜ x 6 in., rolled thread, 80-10; cut thread, 80-5; larger sizes, 75-15; machine bolts up to ⅜ x 4 in., rolled thread, with hot pressed square nuts, 80-15; cut thread, 80-10; larger sizes, 80; gimlet point coach screws, 85; hot pressed nuts, square, $6 off per cwt.; hexagon, $7 off per cwt. Structural rivets, ¾ to 1¼ in., 1.75c. to 1.85c., base, Chicago, in carload lots; boiler rivets, 10c. additional.

Cast-Iron Pipe.—With the exception of 500 tons of pipe for which Macon, Mo., will receive bids on Sept. 14 there is no new work, for the immediate future, not previously reported. Some business has been done in gas pipe, a company at Madison, Wis., taking 200 tons. General pipe business is quiet. We quote as follows, per net ton, Chicago: Water pipe, 4 in., $26.50; 6 in. and larger, $24.50, with $1 extra for class A water pipe and gas pipe.

Old Material.—The usual result of a period of high prices in this market is again apparent in the flood of scrap that has been brought out. Consumers who had bought now appear to have plenty of material on hand and see little reason for anticipating difficulties in filling further wants. The market is accordingly weak, with little or no buying. The absence of trading makes accurate locating of market values somewhat difficult. Where a transaction represents the desire of a consumer to buy, prices are fairly well maintained, but more frequently sales are made under pressure and at lower quotations. Recent railroad sales have brought prices measurably above the market. About 4000 tons of railroad scrap is being offered this week, including 1500 tons from the St. Paul, 1000 tons from the Pere Marquette and 800 tons from the Chicago & Alton. We quote for delivery at buyer's works, Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Old iron rails	$13.50 to $14.00
Relaying rails	19.50 to 20.50
Old carwheels	11.75 to 12.00
Old steel rails, rerolling	13.50 to 14.00
Old steel rails, less than 3 ft.	12.25 to 12.75
Heavy melting steel scrap	11.75 to 12.00
Frogs, switches and guards, cut apart	11.75 to 12.00
Shoveling steel	11.50 to 11.75
Steel axle turnings	8.75 to 9.00

Per Net Ton

Iron angles and splice bars	$13.50 to $13.75
Iron arch bars and transoms	13.75 to 14.25
Steel angle bars	10.75 to 11.25
Iron car axles	15.50 to 16.00
Steel car axles	14.75 to 15.25
No. 1 railroad wrought	11.00 to 11.50
No. 2 railroad wrought	10.50 to 11.00
Cut forge	10.50 to 10.75
No. 1 busheling	9.00 to 9.50
No. 2 busheling	6.75 to 7.25
Pipes and flues	8.50 to 9.00
Steel knuckles and couplers	10.75 to 11.25
Steel springs	10.75 to 11.25
No. 1 boilers, cut to sheets and rings	8.25 to 8.50
Boiler punchings	10.00 to 10.50
Locomotive tires, smooth	11.00 to 11.50
Machine shop turnings	6.75 to 7.00
Cast borings	6.50 to 7.00
No. 1 cast scrap	10.00 to 10.50
Stove plate and light cast scrap	8.75 to 9.00
Grate bars	8.50 to 8.75
Railroad malleable	10.25 to 10.75
Agricultural malleable	9.00 to 9.50

Wire Products.—Fall contracting for wire is under way and the larger jobbers of the Northwest appear disposed to buy even more liberally than in previous years. Buyers are finding the mills unwilling to take on any tonnage in excess of customers' actual requirements. Inquiry for barb wire calls for all that dealers can possibly secure. Prices, adjusted to the basis announced last week, depart very generally from normal differentials. For galvanizing the spread is now 70c. Quotations to jobbers, per 100 lb., are as follows: Plain wire, No. 9 and coarser, base, $1.689; wire nails, $1.889; painted barb wire, $1.989; galvanized barb wire, $2.089; polished staples, $1.989; galvanized staples, $2.089, all Chicago.

Philadelphia

PHILADELPHIA, PA., Sept. 7, 1915.

Interest is pretty well centered at the moment in impending transactions involving probably 50,000 tons of basic pig iron. When the deals are consummated the uncertainty which has prevailed for some days as to the price of basic will be dissipated. The last sale made was one of a lot for prompt delivery which went at $17, delivered. The dominant question has been the price for next year's delivery, producers asking all the way up to $18.50 delivered. In finished steel products, shrapnel and high-explosive rounds lead the demand; some large sales have been made and more inquiries are pending. The demand for and shortage of semi-finished steel continue to be an important feature of the situation. Inquiries mentioned are for 12,000 tons of blooms and 15,000 to 25,000 tons of billets. A sale of 7000 tons of forging billets has been made to France. The current quotation for plates, shapes and bars continues at 1.509c., Philadelphia, or on the basis of 1.35c., Pittsburgh, and manufacturers are still holding back from first quarter contracts. A steel company having its main office here has practically closed on 3000 tons of corrugated sheet steel piling for a retaining wall on the St. Johns River, near Jacksonville, Fla. Foundry iron is strong, but the aggregate of sales is somewhat less. Low phosphorus iron is higher. Old material is active and not so easy to obtain from first hands.

Pig Iron.—Negotiations involving the purchase by an eastern Pennsylvania plate mill of several thousand tons of basic have been under way for some days. It is understood that 45,000 to 50,000 tons for delivery next year represented the aggregate for which inquiry was made. The importance of the impending transaction, or transactions, for it is likely that several sellers will participate, lies not alone in the large tonnage, for the deal, or deals, will serve to fix in this territory the actual market level of basic. The last local sale made, a week or ten days ago, specified prompt delivery of a few thousand tons at $17, delivered. At that time there was talk of $18 for next year, and since then up to $18.50 has been quoted. For standard low phosphorus, $24.50 to $25 has been paid for delivery this year. Makers are well sold up, in fact, some are a little oversold and will be compelled, where they can, to obtain the indulgence of their customers. One firm reports for the week a business of 2500 tons, in which there was one lot of 1500 tons. Lebanon low phosphorus is in a similar position, and $20 at furnace continues to be quoted. For a small lot that price was paid. Reports vary as to the situation in foundry iron, but the majority of sellers say that the booking of orders is below the pace set in August. The Norfolk & Western Railroad ordered against its inquiry for about 4000 tons of miscellaneous grades and obtained some concessions. The quotations for eastern Pennsylvania No. 2, nearby delivery, range from $16 to $16.75. Most of the inquiry is for 1916 delivery, on which sellers generally are disinclined to quote, although some admit that they have booked a few first quarter contracts. One or two producers positively decline to sell into next year. Virginia interests again have raised their prices, although the advance is not unanimous. With one producer, the advance is to $14 at furnace for the remainder of the year for No. 2 X; $13 for No. 2 plain; $12.75 for No. 3 and $12.50 for No. 4 and gray forge. Other companies ask $13.50 at furnace

for No. 2 X, this year's delivery. Another company quotes $17 for No. 2 X. All are subject to a freight rate of $2.75. With some producers shipments of Virginia iron continue to exceed the rate of production to a small extent. A lot of 150 tons of Southern gray forge was sold at $10, Birmingham. Quotations for standard brands, delivered in buyers' yards, shipment ranging from third quarter to last half, range about as follows:

Eastern Penna., No. 2 X foundry	$16.00 to $16.50
Eastern Penna., No. 2 plain	15.75 to 16.25
Virginia, No. 2 X foundry	15.75 to 16.25
Virginia, No. 2 plain	15.50
Gray forge	15.00
Basic	17.00
Standard low phosphorus	24.50 to 25.00

Iron Ore.—No importations of ore are reported by the custom house in the week ended Sept. 4. An Eastern mill has taken 60,000 tons of Lake Superior ore at the scheduled price, and there have been some transactions also in New York State ore.

Ferroalloys.—The quotation for future deliveries of English 80 per cent ferromanganese continues at $100, seaboard, but there is little actual business. Shipments are due to arrive early this month from England. A cargo of 5000 to 6000 tons of Indian manganese ore is expected to arrive at Baltimore within the next three weeks for delivery to a Pennsylvania steel mill, shipment having been permitted under restrictions. Fifty per cent ferrosilicon is unchanged at $73 to $75, Pittsburgh.

Bars.—Shrapnel and high-explosive shell rounds continue to lead in activity, although there is a good demand for ordinary steel bars. For the latter the quotations are 1.509c., Philadelphia, and in some cases 1.559c. Some makers of steel rounds are asking 3.25c. to 3.50c. The quotation for ordinary iron bars is 1.459c., Philadelphia, for carloads. The demand is good.

Plates.—Specifications are being received at a lively rate. The mills are avoiding contracts so far as they can, although some have been made at 1.609c., Philadelphia, for the last quarter. On current business, shipment in five to six weeks, 1.509c., Philadelphia, is obtained. Two additional freight steamers for the Crowell & Thurlow Steamship Company, Boston, are to be constructed by the Newport News Shipbuilding & Dry Dock Company, Newport News, Va. This contract brings the total number of vessels built for the Boston interest by the Newport News Company up to seven. The fifth of these will be launched next month.

Structural Material.—Consumers continue anxious to contract into the fourth quarter of this year and first quarter of next year, but mill representatives are reluctant to quote. Their open quotation is 1.559c., Philadelphia, while to preferred customers they will sell at 1.509c. on good-sized lots. There is considerable railroad bridge work, of which the Pennsylvania Steel Company received 1400 tons from the Pennsylvania Railroad. A few manufacturing plants in this locality requiring shapes will soon come before the trade.

Sheets.—The leading producer in eastern Pennsylvania continues to quote 1.759c., Philadelphia, for No. 10 blue annealed.

Billets.—The demand is heavier than ever. A contract which was closed specifies 7000 tons of forging billets for shipment to France at an exceptionally high price. The American Car & Foundry Company has been in the market for 15,000 to 25,000 tons of billets, while another inquiry is for 12,000 tons of blooms. A sale of a round lot of forging billets was made to a domestic consumer at a price highly satisfactory to the seller. Rerolling billets are quoted at $32 and higher, at which price or its equivalent sales have been made.

Rails.—Quotations have been submitted to the Southern Railway on 5000 tons of rails.

Coke.—There is considerable inquiry for furnace coke, but sales are made slowly. Spot furnace is quoted at $1.60 per net ton at oven, and contract to the end of the year at $1.75. Foundry coke, both prompt and contract, continues to range from $2.20 to $2.60. Freight rates from the principal producing districts are as follows: Connellsville, $2.05; Latrobe, $1.85, and Mountain, $1.65.

Old Material.—The market continues active, and the problem with dealers is chiefly not that of selling but of obtaining material to sell. Two mills took round lots of heavy melting steel. Low phosphorus scrap is particularly strong. Quotations for delivery in buyers' yards in this district, covering eastern Pennsylvania and taking freight rates from 35c. to $1.35 per gross ton, are as follows:

No. 1 heavy melting steel	$15.00 to $15.25
Old steel rails, rerolling	15.50 to 16.00
Low phos. heavy melting steel scrap	19.00 to 20.00
Old steel axles	19.50 to 20.50
Old iron axles (nominal)	22.00 to 23.00
Old iron rails	18.50 to 19.00
Old carwheels	14.00 to 14.50
No. 1 railroad wrought	16.50 to 17.00
Wrought-iron pipe	14.50 to 15.00
No. 1 forge fire	11.00 to 11.50
Bundled sheets	11.00 to 11.50
No. 2 busheling	9.50 to 10.00
Machine shop turnings	10.50 to 11.00
Cast borings	10.50 to 11.00
No. 1 cast	14.00 to 14.50
Grate bars, railroad	10.50 to 11.00
Stove plate	10.50 to 11.00
Railroad malleable	10.50 to 11.00

Cincinnati

CINCINNATI, OHIO, Sept. 8, 1915.—(*By Wire.*)

Pig Iron.—The business transacted last week consisted mainly of carload lots for prompt shipment, with a few contracts for 100 to 300 tons of Southern iron for last quarter delivery. Consumers of Southern iron are waiting for producers to formally open their books for next year, and are apparently not in any hurry to force the issue. Many melters have covered for more than enough iron to run them through the year and few of the foundries will find it necessary to buy fill-in lots for last quarter's needs. With the exception of the stove trade, the general tendency of foundry operations is toward improvement and basic pig-iron consumers are also gradually increasing their melt. The majority of Southern furnacemen are holding firmly at $11.50, Birmingham basis, for this year's shipment, but some prompt iron is still available at $11. While the furnaces in all districts are gradually working prices upward, the limited amount of iron changing hands at varying quotations makes it difficult to say what Southern figures should be. Northern No. 2 foundry is unchanged and very firm at $14, Ironton, and basic and malleable are also quoted at the same figure. An advance of 50c. is asked for first half shipment. The Ohio silvery irons are not quite as active this week, but prices are steady and most producers are now asking $17 at furnace for this year and $17.50 for the first half, but some $16.50 8 per cent iron can yet be bought for this year's shipment. The International Steam Pump Company is understood to have purchased a part of its requirements, but is still deadlocked with Southern furnaces on first half shipment prices. All agencies report shipments of foundry iron on old contracts as going forward at a satisfactory rate. Based on freight rates of $2.90 from Birmingham and $1.26 from Ironton, we quote, f.o.b. Cincinnati, as follows:

Southern coke, No. 1 f'dry and 1 soft	$14.40 to $14.90
Southern coke, No. 2 f'dry and 2 soft	13.90 to 14.40
Southern coke, No. 3 foundry	13.40 to 13.90
Southern No. 4 foundry	12.90 to 13.40
Southern gray forge	12.40 to 12.90
Ohio silvery, 8 per cent silicon	17.76 to 18.01
Southern Ohio coke, No. 1	16.26 to 16.51
Southern Ohio coke, No. 2	15.26 to 15.51
Southern Ohio coke, No. 3	15.01 to 15.26
Southern Ohio malleable Bessemer	15.26 to 15.51
Basic, Northern	15.26 to 15.51
Lake Superior charcoal	16.20 to 17.20
Standard Southern carwheel	26.90 to 27.40

(*By Mail*)

Coke.—Nearly all of the foundries have covered for future requirements, and there is little buying of 72-hr. coke from any producing territories. Furnacemen who have not contracted ahead are at a deadlock with oven operators as to contract prices. A few operators in the Connellsville and Pocahontas fields are asking as high as $2.25 to $2.50 for first half furnace coke. Spot shipment quotations on 48-hr. brands range from $1.60 to $1.70 per net ton at oven. It is quite probable that some fair-sized contracts will be made before the

month is up if buyers and sellers can agree. Foundry coke is quoted in all three districts around $2.25 to $2.75 for either prompt or deferred shipment.

Finished Material.—The erratic condition of the spelter market continues to affect galvanized sheets, and to-day's quotations by nearby mills range from 3.65c. to 3.75c., Pittsburgh basis, on No. 28. The same gage of black sheets is quoted at 1.90c. to 2c., Pittsburgh. The local warehouse quotation on No. 28 galvanized sheets remains at 4.50c. Prompt shipment business in both black and galvanized sheets shows some improvement. Structural shapes are held around 1.90c. to 2c. from warehouse stocks and the store price of steel bars ranges from 1.85c. to 1.90c. The mill quotation on steel bars is 1.35c., Pittsburgh.

Old Material.—Business is rather slow, but prices are firm, with a tendency to go still higher should any large demand for future shipment develop from the rolling mills. The jobbing foundries are consuming a comparatively large quantity of scrap, but the stove foundries are poor customers at present. The minimum figures given below represent what buyers are willing to pay for delivery in their yards, southern Ohio and Cincinnati, and the maximum quotations are dealers' prices f.o.b. at yards:

Per Gross Ton

Bundled sheet scrap	$8.50 to $9.00
Old iron rails	12.00 to 12.50
Relaying rails, 50 lb. and up	20.25 to 20.75
Rerolling steel rails	10.50 to 11.00
Heavy melting steel scrap	10.50 to 11.00
Steel rails for melting	10.50 to 11.00

Per Net Ton

No. 1 railroad wrought	$9.50 to $10.00
Cast borings	6.25 to 6.75
Steel turnings	5.75 to 6.25
Railroad cast scrap	10.25 to 10.75
No. 1 machinery cast scrap	11.50 to 12.00
Burnt scrap	7.50 to 8.00
Old iron axles	15.00 to 15.50
Locomotive tires (smooth inside)	9.75 to 10.25
Pipes and flues	7.25 to 7.75
Malleable and steel scrap	8.50 to 9.00
Railroad tank and sheet scrap	6.50 to 7.00

Cleveland

CLEVELAND, OHIO, Sept. 7, 1915.

Iron Ore.—Shipments from the mines of the Lake Superior district in August amounted to 8,081,117 gross tons, breaking all previous records with the exception of July, 1913, when the movement exceeded that of the past month by 123,299 tons. The increase over August, 1914, was 2,211,640 tons. Shipments up to Sept. 1 were 26,806,420 tons, which is an increase of 5,528,313 tons over the same period last year. Inability to secure foreign ores has stimulated the Eastern market recently, and one interest reports Eastern sales in the past few days aggregating about 80,000 tons, mostly ore bearing manganese. One Eastern steel company is understood to have taken about 300,000 tons of Lake ore, the sale of this tonnage, or at least the most of it, being an inside deal. It is estimated that total sales for shipments East so far this year amount to about 750,000 tons. The market has quieted down, most consumers being covered for their requirements until the next season of navigation. However, one inquiry for about 50,000 tons is pending. Ore is going forward to furnaces at a good rate, as is indicated by the fact that, with the large gain in shipments over last year, there was less ore on the Lake Erie docks Sept. 1 than a year ago. On Sept. 1 there was 7,118,949 tons of ore on docks at Lake Erie ports as compared with 7,285,150 tons on the same date in 1914. We quote prices as follows, delivered to lower Lake ports: Old Range Bessemer, $3.75; Mesaba Bessemer, $3.45; Old Range non-Bessemer, $3; Mesaba non-Bessemer, $2.80.

Pig Iron.—Local selling agencies have booked considerable additional tonnage of foundry and malleable iron in the adjoining territory for shipment during the first half, but the market in this immediate territory is not active. One local sale is reported of close to 2000 tons of No. 2 foundry to a Cleveland consumer at $15 at furnace. Some local iron has been sold at this price for outside shipment to points having a 90c. freight rate and the local market appears to be firm at the $15 price. Higher quotations are being made by one Lake furnace that has been a low seller and it is doubtful if any more $14 iron can be had. A northern Ohio steel interest which was in the market a few weeks ago for basic iron for the last and first quarters, but which did not buy at the time, came out last week with another inquiry for the same delivery, but, as far as is definitely known, purchased only a small lot of iron for November and December delivery. Southern iron is inactive. While most producers are asking $11.50, Birmingham, for No. 2 for the remainder of the year, several small sales of No. 1 soft in the local market are reported at $11.50, or on the basis of $11 for No. 2. Some of the producers have advanced prices on Ohio silvery to $17 at furnace for 8 per cent for this year's delivery and to $17.50 for the first half. We quote, delivered Cleveland, as follows:

Bessemer	$16.65 to $16.90
Basic	15.30
Northern No. 2 foundry	15.30
Southern No. 2 foundry	15.00 to 15.50
Gray forge	14.75
Jackson Co. silvery 8 per cent silicon	18.12 to 18.62
Standard low phos., Valley furnace	23.00

Coke.—There is little new demand. Standard furnace coke is held at $1.50 to $1.60 per net ton at oven for prompt and $1.75 to $1.85 for the last quarter. Standard makes of Connellsville foundry coke are quoted at $2.25 to $2.50 for early shipment. For the first half contract prices up to $2.60 to $2.75 are quoted.

Finished Iron and Steel.—Specifications are very heavy and there is a fair volume of new inquiry. Prices are very firm and some mills are taking orders for steel bars, plates, and structural material in less than carload lots at 1.40c., Pittsburgh. The Hydraulic Pressed Steel Company, Cleveland, has taken a subcontract for 2,500,000 steel forgings for Russian shells for delivery during the year from Oct. 1, which will require about 16,500 tons of 3¼-in. rounds, and has a conditional order for 2,500,000 additional shell forgings for delivery during five months after the expiration of the first contract. It has not purchased the steel and has an inquiry out for the entire 33,000 tons. Plates are firm, with 1.30c., Pittsburgh, as the minimum quotation. The demand for structural material has improved and several building contracts requiring fair sized lots are about to be placed. The Morava Construction Company, Chicago, has taken 600 tons for a plant for the Consolidated Press & Tool Company, Hastings, Mich. Charles N. Vickery, Canton, Ohio, has taken bids for 500 tons for a commercial building. While there is a fair demand for sheets, orders are not sufficient to keep all mills running to capacity. Prices are firm at 1.90c., Pittsburgh, for No. 28 black; 1.45c. to 1.50c. for No. 10 blue annealed, and 3.75c. for No. 28 galvanized. The Clover Leaf Railroad is in the market for 3000 tons of steel rails. Bar-iron prices are unchanged at 1.18½c., East Chicago, and 1.25c., Pittsburgh. Warehouse prices are 1.90c. for steel bars and 2c. for plates and structural material.

Bolts, Nuts and Rivets.—Makers have advanced prices 5 per cent on bolts except on large sizes and from $4 to $6 a ton on nuts, owing to the higher prices for steel. Specifications are heavy and mills are well filled with orders. Rivets are firm at 1.60c., Pittsburgh, for structural and 1.70c. for boiler rivets. Revised bolt and nut discounts are as follows: Common carriage bolts, ⅜ x 6 in., smaller or shorter, rolled thread, 75, 10 and 10 per cent; cut thread 75 and 10; larger or longer, 75 and 5; machine bolts with h. p. nuts ⅜ x 4 in., smaller or shorter, rolled thread, 75, 10, 10 and 5; cut thread 75, 10 and 10 per cent; larger and longer, 75 and 10; coach and lag screws, 80 and 15; square h. p. nuts, blank or tapped, $5.80 off the list; hexagon h. p. blank or tapped, $6.30 off; c. p. c. and t. square nuts blank or tapped, $5.30 off; hexagon ⅝ in. and larger, $6.75 off; 9/16 in. and smaller, $7.25 off; cold pressed semi-finished hexagon nuts ⅝ in. and larger, 85 off; smaller, 85 and 10.

Old Material.—The market is fairly active in steel-making grades. Although mills are well supplied they are taking on additional material that is offered them

in small lots for delivery in the next sixty days. Two local mills have shut off on shipments and that has had a weakening effect on prices of such grades for Cleveland delivery. Quotations on heavy steel borings and turnings have declined 25c. per ton. Other quotations are unchanged. We quote, f.o.b. Cleveland, as follows:

Per Gross Ton

Old steel rails	$13.00 to $13.50
Old iron rails	14.00 to 14.50
Steel car axles	16.00 to 17.00
Heavy melting steel	12.50 to 12.75
Old carwheels	11.50 to 11.75
Relaying rails, 50 lb. and over	22.50
Agricultural malleable	10.00 to 10.25
Railroad malleable	12.25 to 12.75
Steel axle turnings	10.00
Light bundled sheet scrap	10.00 to 10.50

Per Net Ton

Iron car axles	$17.25 to $17.75
Cast borings	7.00 to 7.25
Iron and steel turnings and drillings	6.00 to 6.25
No. 1 busheling	9.50 to 10.00
No. 1 railroad wrought	11.50 to 12.00
No. 1 cast	11.00 to 11.50
Railroad grate bars	9.00 to 9.50
Stove plate	8.75 to 9.00

Birmingham

BIRMINGHAM, ALA., Sept. 6, 1915.

Pig Iron.—The market has advanced to $11.50 for spot and rest of year and $12.50 for 1916 delivery, with sales made at both figures by at least two interests. The $12.50 quotation for 1916 is uniform with all makers. The striking feature of the market during the first four days of September was the refusal of one maker to book a heavy spot tonnage for speculators at $11.25. This tonnage was in numerous offers of varied size, but the total was considerable. The leading interest is sold up well into the first quarter of 1916, as well as for the remainder of the year. Sales for 1916 at the $12.50 rate by all sellers had aggregated between 30,000 and 40,000 tons by the close of the first week in the month. In the early part of the week firm offers of $12 for 1916 iron were turned down. One maker sold 5000 tons for rest of year at $11.50 in the first three days of the month. Two sales of No. 1 at $12 were made. None of the recent sales has been made through special solicitation, the business coming at the instance of the consumers. Indications point to still higher prices in the near future. Some makers are oversold for this year and one is oversold through the first quarter of 1916. None has iron to spare. Each increase in output is taken care of at once. Home consumption is steadily on the increase. Shipments are greater than output. The latter has recently been increased by the blowing in of Vanderbilt stack of the Woodward Iron Company, while a second stack of the Tennessee Company at Bessemer is active again, a net gain of two. The latter company now has ten active stacks—three on foundry and the rest on basic—Sloss-Sheffield four, Republic two, Woodward four, Central Coal & Iron one, Gulf States Steel one, Alabama Company one, and Shelby one active charcoal stack. The Woodward Company has completed its benzol plant and the Tennessee Company's is about completed. Steel works are still running at capacity. The wire mill of the American Steel & Wire Company is on double turn. Foreign business in shrapnel stock and wire is heavy. Wire bookings, in fact, are to capacity for some time to come. Local foundries are taking more pig iron. We quote, per gross ton, f.o.b. Birmingham district furnaces, for rest of year and 1916 as follows:

No. 1 foundry and soft	$12.00 to $13.00
No. 2 foundry and soft	11.50 to 12.50
No. 3 foundry	11.00 to 12.00
No. 4 foundry	10.75 to 11.75
Gray forge	10.50 to 11.50
Basic	11.50 to 12.50
Charcoal	21.00 to 21.50

Cast-Iron Pipe.—While prices were not marked up the past week, the tendency is in that direction and an advance may be expected at any time. Water and gas pipe plants continue to receive orders sufficient to justify 85 per cent operations. Some very large business is being figured on for Western delivery, with considerable other tonnage in sight. Sanitary shops bid fair to assume larger operations in view of increasing building activity in the South, which winter does not interfere with. We quote, per net ton, f.o.b. pipe shop yards, as follows: 4-in., $21.50; 6-in. and upward, $19.50, with $1 added for gas pipe.

Coal and Coke.—The Tennessee Company is now out of the general coal market and other furnace operators are about to withdraw. Independent coal mines feel the change. Output is on the increase everywhere. The Tennessee Company made its initial shipment of coal for Louisiana points via the Warrior River the past week, the business assuming regular operations from the start. Six self-propellers are carrying the coal. The De Bardeleben Coal Company is having six 600-ton barges built at New Orleans and will enter the Warrior River trade for Gulfport, Mobile and Mississippi River delivery in the near future. The coal will be carried by rail to Cordova at the head of navigation. The Woodward Iron Company, having completed repairs on its Koppers by-product ovens, presumably has coke sufficient for all purposes, but for insurance against coke scarcity, it is repairing its 1000 beehive ovens, which will be fired if needs be. The Semet-Solvay Company has ceased supplying the Gulf States Steel Company, the Tennessee Company requiring the entire output under contract. Coke prices have not yet been much affected. Importations of Virginia and West Virginia coke are being figured on. We quote, per net ton, f.o.b. ovens, as follows: Beehive furnace, $2.75 to $3; beehive foundry, $3 to $3.25; by-product, $2.50 to $2.75, with some makes higher.

Old Material.—Scrap dealers have no difficulty in disposing of stocks of practically all grades. Yards are almost bare. Country scrap has come in freely and is quickly sold. Prices have not yet been raised over recent advances. We quote, per gross ton, f.o.b. yards, as follows:

Old iron axles	$13.50 to $14.00
Old steel axles	13.00 to 13.50
Old iron rails	12.50 to 13.00
No. 1 railroad wrought	9.50 to 10.00
No. 2 railroad wrought	8.50 to 9.00
No. 1 country wrought	8.50 to 9.00
No. 1 machinery cast	9.50 to 10.00
No. 1 steel scrap	9.50 to 10.00
Tram carwheels	9.50 to 10.00
Stove plate	8.00 to 8.50

St. Louis

ST. LOUIS, MO., Sept. 6, 1915.

Pig Iron.—Transactions continue to be made in considerable numbers, but the individual tonnages are running 500 tons and under and deliveries are for the last quarter. To some degree consumers seem to feel that if they put out inquiries too freely they will create the appearance of pressing demand and so force prices beyond their present level. Sales are reported at $11.50, Birmingham, No. 2 Southern, and $13 is about the best price made here for first quarter. One inquiry outstanding is for 1000 tons of Lake Superior carwheel iron. In Southern iron the aggregate for the week was about 3000 tons.

Coke.—Transactions were chiefly in small lots for quick delivery at somewhat higher prices than contract figures. Local by-product continues to control the market at this point.

Finished Iron and Steel.—In finished products there has been a steady increase in orders and business is now reported practically up to normal in the aggregate. There is no contracting ahead for large quantities and no large individual orders are being placed, but the demand is widespread. In standard section rails the southwestern railroads are likely to enter at any time. Deliveries are becoming still more extended on all material and the warehouses are profiting by the needs of the consumers for quick supply. Movement out of warehouse is therefore good. We quote for stock out of warehouse as follows: Soft steel bars, 1.80c.; iron bars, 1.75c.; structural material, 1.90c.; tank plates, 1.90c.; No. 10 blue annealed sheets, 2.10c.; No. 28 black sheets, cold rolled, one pass, 2.55c.; No. 28 galvanized sheets, black sheet gage, 4.50c., but subject to change without notice owing to spelter conditions.

Old Material.—There has been a further cessation of speculative activity, but the prices generally are

quite firm. There is particular activity in the demand for steel axles for export. Sales to other points than St. Louis territory continue profitable. Lists out during the week include 500 tons from the Mobile & Ohio, 1500 tons from the Wabash, 13,000 tons from the Baltimore & Ohio, 1200 tons from the Terminal Railroad Association of St. Louis, 3500 tons from the Southern Railway, 150 tons from the Kansas City Southern, and 1200 tons from the Missouri Pacific. We quote dealers' prices, f.o.b. consumer's works, St. Louis industrial district as follows:

	Per Gross Ton	
Old iron rails	$11.00 to	$11.50
Old steel rails, rerolling	12.75 to	13.25
Old steel rails, less than 3 ft	12.50 to	13.00
Relaying rails, standard section, subject to inspection	21.00 to	23.00
Old carwheels	10.50 to	11.00
No. 1 railroad heavy melting steel scrap	11.50 to	12.00
Shoveling steel	9.50 to	10.00
Frogs, switches and guards cut apart	11.50 to	12.00
Bundled sheet scrap	7.50 to	8.00
	Per Net Ton	
Iron angle bars	$11.75 to	$12.00
Steel angle bars	10.00 to	10.50
Iron car axles	15.75 to	16.25
Steel car axles	14.75 to	15.25
Wrought arch bars and transoms	13.75 to	14.25
No. 1 railroad wrought	10.50 to	10.75
No. 2 railroad wrought	9.75 to	10.25
Railroad springs	11.25 to	11.75
Steel couplers and knuckles	11.00 to	11.50
Locomotive tires, 42 in. and over, smooth inside	12.00 to	12.25
No. 1 dealers' forge	9.25 to	9.50
Mixed borings	6.00 to	6.50
No. 1 busheling	9.00 to	9.50
No. 1 boilers, cut to sheets and rings	7.50 to	8.00
No. 1 railroad cast scrap	10.50 to	10.75
Stove plate and light cast scrap	8.50 to	8.75
Railroad malleable	8.75 to	9.00
Agricultural malleable	7.75 to	8.00
Pipes and flues	7.25 to	7.75
Railroad sheet and tank scrap	7.00 to	7.25
Railroad grate bars	7.00 to	7.50
Machine shop turnings	7.00 to	7.50

New York

NEW YORK, Sept. 8, 1915.

Pig Iron.—In a general way sellers of pig iron refer to sales made at the advancing prices and it is stated in this connection that the higher figures recently reported as being asked for shipments in the first quarter and first half of 1916 have been obtained on a fair volume of transactions. None of these, in the Eastern territory at least, stand out as conspicuous for their size. One sale of 1000 tons is reported in Connecticut. The leading Virginia producer has advanced its prices for the last quarter of 1915 and the first quarter of 1916 to $14 at furnace for No. 2 X foundry iron. The prices on lower grades, however, have not gone up proportionately, as No. 2 plain for the deliveries stated is quoted at $13 at furnace. The advance on No. 2 X is 50c. Some Buffalo furnaces are now quoting $16 for the last quarter of this year, in view of the recent sale there of 50,000 tons of basic iron, which is to be delivered as hot metal in all the remaining weeks of this year. Eastern Pennsylvania furnaces are asking from $15.50 to upward of $16 at furnace for No. 2 X foundry iron for delivery in the early part of 1916. In the past week or two sales for delivery in the first quarter or half of next year, while not large, have been more than those for delivery this year. It is evident, however, that the average foundry is not prepared to consider next year's iron. We quote at tidewater as follows for fourth quarter delivery: No. 1 foundry, $16.50 to $16.75; No. 2 X, $16.25 to $16.50; No. 2 plain, $15.75 to $16; Southern iron, $16.50 to $17 for No. 1 and $16.25 to $16.50 for No. 2.

Ferroalloys.—Sales of small lots of British ferromanganese, subject to permission to ship, are being made in this market at $100, seaboard, for carloads and $110 for smaller quantities. Receipts from British producers are small, but prospects for larger September business continue good in some quarters. The amount imported on August licenses is estimated not to exceed 2000 gross tons, against average monthly imports of 8400 tons in ordinary times. One New York representative is still out of the market. The higher grade spiegeleisen is hard to obtain, while it is understood that the lower, or 16 to 19 per cent grade, is quoted on a basis of $28, at furnace, for the 19 to 21 per cent brand, an advance of $2. Ferrosilicon, 50 per cent, is very active, the demand from both domestic and foreign sources taxing the supply.

Structural Material.—In spite of the relatively few new projects appearing, prices rule strong. With some mills 1.40c., Pittsburgh, is minimum and a fourth quarter contract has been closed between a mill and fabricator at 1.50c., Pittsburgh. To be sure, many view this as an option, but it remains as an indication of the ideas of price tendencies. Structural rolling mills are well occupied, with deliveries as extended as they were last week, and yet were the requirements for transportation purposes in New York and Philadelphia substracted from totals, it is felt that the remainder would not be much more than half the capacity of the country's fabricating shops. The largest award of the East is for the Bethlehem Steel Company, given to the McClintic-Marshall Company, 2500 tons for a machine shop and 3500 tons for a mill building. Among other awards may be mentioned 2600 tons to the American Bridge Company for a building and a crane runway at the Cramps shipyard, Philadelphia; 600 tons to the American Bridge Company for the freight shed, Twenty-ninth Street, Brooklyn; 1000 tons to Hay Foundry & Iron Works for the Degnon building, Long Island City, and 1800 tons to Milliken Brothers, Inc., for the Guaranty Building, Fifth Avenue and Forty-third Street. To the list of apartment houses, which are the structures most conspicuously active at this time, may be added the Mordecai apartment, Park Avenue and Fifty-first Street, taking 1000 tons. We quote mill shipments at 1.35c. to 1.40c., Pittsburgh, or 1.519c. to 1.569c., New York. For small lots from store we quote 2.05c. to 2.10c., New York.

Iron and Steel Bars.—Mills are alert for 1916 business in large rounds for projectiles. An agricultural implement company of the Middle West has a contract for 2,000,000 shells of a large range of sizes, involving probably 15,000 tons of steel. A Middle West railroad car builder is to supply 2,500,000 shells to a Philadelphia works for the machining; a western Pennsylvania pump concern has a sizeable contract; two western Pennsylvania concerns are to furnish shell forgings for shipment to England, in one case 200,000 to be completed ready for machining by about March 1; an eastern Pennsylvania car builder has a similar contract, and so it goes. Many of these companies at the outset of the negotiations secured options on the steel and apparently at considerably better prices than the 3c. to 3.5c. commonly talked of now. Fourth quarter bar contracts are not yet a matter of much consideration. In one quarter the view is taken that it is best not to emphasize unduly the possibility of higher prices for that period, as it would tend to aggravate specifications on contracts from a speculative standpoint. We quote mill shipments of steel bars at 1.35c., Pittsburgh, or 1.519c., New York, and refined iron bars, 1.469c., New York. Out of store in New York iron and steel bars are 2c. to 2.05c.

Steel Plates.—Most of the new business appears to be going at 1.35c., Pittsburgh, with occasional lots at 1.40c., while a contract price of 1.45c. has been agreed on for a limited tonnage for fourth quarter. No export business of importance has been closed in this territory. Some encouragement is to be taken in car business, as some fair lots have lately been closed and the Illinois Central is expected to buy 4000 cars; the Wheeling & Lake Erie, 650 gondolas and 200 automobiles, and the New York Central 1000 box, the last, it is understood, temporarily held for some revision in design. The Pullman Company is to build 500 stock cars for the Santa Fe; the American Car & Foundry Company, 120 box cars for the Virginia-Carolina and 200 box cars for the Nashville, Chattanooga & St. Louis; Pressed Steel Car Company, 899 underframes for the Buffalo, Rochester & Pittsburgh, and 100 ore cars for the Anaconda; the Standard Steel Car Company 1100 center constructions for the Maine Central, and the Haskell & Barker Car Company 100 underframes for the Pennsylvania Lines West. It is believed that contracts have been closed for 300 auto-

mobile cars for the Chicago & Northwestern, for 100 cars to the Bangor & Aroostook and for 500 cars for the Cuba company. We quote mill shipments of plates at 1.35c. to 1.40c., Pittsburgh, or 1.519c. to 1.569c., New York. Plates from store are 2.05c. to 2.10c., New York.

Cast-Iron Pipe.—The passing of summer is given as the cause of the falling off in public lettings. It is expected that this class of business will be quiet until preparations are made for municipal improvements to be started next spring. Private buying continues in good volume, and more consumers are feeling the market for prices on deliveries to be made next year. The rise in pig iron and the possibility of still higher prices being reached cause pipe founders to hesitate to name prices so far ahead. Another advance has been made, and carload lots of 6-in., class B, and heavier are now quoted at $24 to $24.50 per net ton, tidewater, class A and gas pipe taking an extra of $1 per ton.

Old Material.—Prices continue to gain strength, notwithstanding the fact that transactions are not heavy. The quantity of old material immediately available is not excessive, as holders are steadily raising their views of the value of their holdings. Brokers are paying about as follows to local dealers and producers, per gross ton, New York:

Old girder and T rails for melting	$12.25 to $12.50
Heavy melting steel scrap	12.25 to 12.50
Relaying rails	19.50 to 20.00
Rerolling rails	13.00 to 13.50
Iron car axles	22.00 to 22.50
Steel car axles	17.50 to 18.00
No. 1 railroad wrought	14.00 to 14.50
Wrought-iron track scrap	13.00 to 13.50
No. 1 yard wrought, long	12.75 to 13.00
No. 1 yard wrought, short	12.25 to 12.50
Light iron (nominal)	4.00 to 4.25
Cast borings	8.00 to 8.50
Wrought turnings	8.00 to 8.50
Wrought pipe	11.50 to 12.00

Cast scrap continues in only moderate demand. Dealers' quotations to consumers of cast scrap are as follows, per gross ton, New York:

Old carwheels	$11.50 to $12.00
No. 1 cast (machinery)	12.75 to 13.00
No. 2 cast (heavy)	11.75 to 12.00
Stove plate	9.75 to 10.00
Locomotive grate bars	8.50 to 8.75
Malleable cast (railroad)	10.00 to 10.50

British Market Easier

Ferrosilicon Still Advancing—Exports Hampered and Decreasing

(By Cable)

LONDON, ENGLAND, Sept. 8, 1915.

The pig-iron market is easier but export business is seriously hampered by lack of shipping facilities. Shipments so far show a considerable decrease compared with last year. Furnaces in blast are 163 against 153 last year and works are striving to increase their output. Hematite iron is steady and unchanged, with general demand fair. Iron ore is quiet. Stocks of pig iron in Connal's stores were 142,559 tons at the close of last week as compared with 141,840 tons a week ago.

American 2-in. billets are quoted at about £8 c.i.f. Liverpool. Finished steel remains strong with prices tending upward. Tin plates are weak and makers are holding out for better terms. We quote as follows:

Tin plates, coke, 14 x 20, 112 sheets, 108 lb., f.o.b. Wales, 18s. against 18s. 3d. a week ago.

Cleveland pig-iron warrants, 64s. 4½d. against 65s. 1½d. last week.

No. 3 Cleveland pig iron, maker's price, f.o.b. Middlesbrough, 64s. 6d. compared with 65s. 3d. one week ago.

Steel black sheets, No. 28, export f.o.b. Liverpool, £11 15s.

Steel ship plates, Scotch, delivered local yards, £10 5s. compared with £10 a week ago.

Steel rails, export, f.o.b. works port, £8 17s. 6d.

Hematite pig iron, f.o.b. Tees, 96s.

Steel bars (Welsh), delivered at works in Swansea Valley, £7 5s.

Steel joists, 15 in., export, f.o.b. Hull or Grimsby, £10 10s.

Steel bars, export, f.o.b. Clyde, £12 against £11 5s. last week.

Ferromanganese, f.o.b., £20 15s.

Ferrosilicon, 50 per cent, c.i.f. £19 10s. against £19 a week ago.

Confidence Lacking—Finished and Semi-Finished Steel Very Firm

(By Mail)

LONDON, ENG., Aug. 25, 1915.—The tone in the pig-iron market remains exceedingly quiet, but current needs are absorbing the whole of the output and blast-furnace owners are hopeful of an improvement in the near future. They with others, however, are bewildered and disappointed at the creeping paralysis which seems to have overcome the military policy in western Europe. Altogether there is nothing in the general situation calculated to assist confidence in the markets. Pig-iron makers are unwilling to accept lower prices, holding to their old dictum that there never was a profit in making pig iron, while buyers are determined under the present conditions not to purchase one ton more metal, or anything else, than necessary.

GLOOM AND DISSATISFACTION

Given a little revival of confidence matters might undergo a distinct change, but meantime the atmosphere is one of deepening gloom and dissatisfaction with everything military and political. There is not much business in hematite iron, the market for which is likely to remain stagnant as long as sellers refuse to make further contracts. The consuming trades are generally well covered for the next two or three months, and are not at all encouraged to buy ahead with sentiment as bad as it is, particularly now that the serious ore trouble which threatened in Spain seems to have been dispelled. This was undoubtedly caused by German agents, and the settlement may be only a temporary one. If one or two Spanish steamers were lost in the ore trade it is thought by the leading interests concerned that this would immediately stop all shipments of Spanish ores to British ports.

Conditions show very little alteration in the semi-finished and finished trades, where generally there is an excess of demand over production. Prices are very firm in all directions, and the advanced wages being paid hold out little hope of any abatement in this regard.

EMPLOYMENT CONTINUES GOOD

Official returns indicate that employment continues good, which last month showed an expansion compared with June, especially at the foundries, while shortage and high prices of fuel and raw material, difficulties of transport, and scarcity of labor were general. In the Tyne and Wear districts there was some overtime worked, but at the angle mills time was being lost owing to the scarcity of labor. In the Sheffield district full time was worked with overtime in the billet mills and in ammunition works, while similar conditions were reported in Scotland.

There is not much change in tin plates except that the tone is generally easier. At the end of the half year there were 396 mills in operation, a decrease of 59 compared with a year ago. Employment showed a slight improvement during July, but was affected adversely by the embargo placed on shipments of tin plates to Norway. while a number of plants have been working irregularly in consequence of the withdrawal of many of the younger mill men for munitions work. There was a small improvement in the galvanized sheet trade, where at the end of the half year 79 sheet mills were operating, compared with 77 in May and 122 a year ago.

The Allis-Chalmers Mfg. Company, Milwaukee, Wis., on Sept. 1 restored in full the 10 per cent reduction in the wages of the office force made March 1 because of business depression. On July 1 one-half of the cut, or 5 per cent, was restored. The company is now employing in excess of 4000 workmen at the main works in West Allis and the Reliance works in Milwaukee, and 1000 at the Bullock works, Norwood, Cincinnati. In August 400 men were added at West Allis. The operations at this time are on a basis of 75 per cent of full capacity, but some shops are working over and double time.

Metal Market

NEW YORK, Sept. 8, 1915.

The Week's Prices

Cents Per Pound for Early Delivery

	Copper, New York			Lead		Spelter	
Sept.	Lake	Electrolytic	Tin, New York	New York	St. Louis	New York	St. Louis
1	18.00	17.75	33.50	4.90	4.75	15.25	15.00
2	18.00	17.75	33.62½	4.90	4.75	15.00	14.75
3	18.00	17.75	33.87½	4.90	4.75	15.00	14.75
4	18.00	17.75	.....	4.90	4.75	14.75	14.50
7	18.00	17.50	33.25	4.90	4.75	14.50	14.25

The cessation of copper buying has brought price concessions. Tin is inactive, and quotations are lower. Lead is fairly firm at unchanged prices. Spelter is dull and lower also. Antimony is waiting for buyers at sustained quotations.

New York

Copper.—The market is extremely dull. Despite the efforts of producers to hold the price of electrolytic at 18c., full terms, second hands have made offerings all the way down to 17.50c., full terms. Lake is unchanged at 18c., but no transactions are reported. The market became exceedingly easy last week when foreign exchange was erratic and touched unprecedented low levels, but became firmer when the foreign exchange rate advanced. While the better price of foreign money had a salutary effect it did not start business. The market is in all respects a waiting one. The exports for the first week of September totaled only 395 tons.

Tin.—Buyers have continued to stay out of the market. There has been no buying of futures whatever, and but little of spot. The quotation yesterday was 33.25c. Late last week prices stiffened a little, which was due to the strengthening of the pound sterling rate of exchange, but it did not induce buyers to take hold. Yesterday the market was so extremely dull that some of the dealers prolonged their holiday by closing early. In London standard futures are £1 10s. over spot standard, while in New York practically no premium is asked for future positions of the metal itself. The arrivals this month total 1095 tons, including 650 tons in one lot from Singapore. There is now afloat 5463 tons, indicating heavy arrivals for September.

Lead.—Sellers are disappointed because of the quickness with which the recent great activity subsided. Despite the quiet which has prevailed, prices are rather firmly held at 4.90c., New York, and 4.75c., St. Louis, which are quoted by the leading interest. Second hands are disposed to shade these quotations a little, but the quantities they offer are not great enough to have much effect on the market. It is intimated that 4.72c., St. Louis, would be accepted. The general belief of the trade is that prices will hover where they are for a few weeks. Only 23 tons has been exported this month.

Spelter.—Ordinary grades of prime Western have been quiet for the most part, although there have been occasionally flurries of inquiry. Yesterday there was a little activity which developed quotations as follows: 14.25c. to 14.50c., St. Louis, for prompt; 14c. for September and 13.50c. for last quarter delivery. Brass mill spelter was to be had at a premium of 2c. over these prices. Horsehead is still quoted at around 40c. Consumers appear to be skeptical with regard to the market ever since the recent rapid advance of spelter and copper. The offering of speculative lots has been the principal factor in giving the market its easier tone. The exports in the first week of September totaled 328 tons.

Old Metals.—The market shows no improvement. Dealers' selling quotations are entirely nominal as follows:

	Cents per lb.
Copper, heavy and crucible	17.00 to 17.25
Copper, heavy and wire	16.25 to 16.75
Copper, light and bottoms	14.00 to 14.50
Brass, heavy	12.00 to 12.50
Brass, light	9.75 to 10.25
Heavy machine composition	13.00 to 13.50
No. 1 yellow rod brass turnings	13.75 to 14.25
No. 1 red brass or composition turnings	12.00 to 12.50
Lead, heavy	4.25
Lead, tea	4.00
Zinc scrap	12.00 to 13.00

Antimony.—There is plenty of Chinese antimony to be had at 28c. to 29c., duty paid. The trade is waiting for consumers to show some interest.

Chicago

SEPT. 7.—While the copper market is for the present strongly held, a lack of confidence in the continuance of current prices is apparent. The tendency in other metals is upward, though spelter quotations are erratic. We quote: Casting copper, 17c.; Lake copper, 17.75c.; tin, carloads, 34.50c.; small lots, 36c.; lead, 4.90c.; spelter, nominally, 15c.; sheet zinc, nominally, 17c.; Cookson's antimony, 47.50c. to 50c.; other grades, 32c. On old metals we quote buying prices for less than carload lots as follows: Copper wire, crucible shapes, 13c.; copper bottoms, 12c.; copper clips, 12.50c.; red brass, 10.50c.; yellow brass, 9.50c.; lead pipe, 3.75c.; zinc, 9c.; pewter, No. 1, 17c.; tinfoil, 24c.; block tin pipe, 26c.

St. Louis

SEPT. 6.—Non-ferrous metals have been quiet, except lead which has moved up to 4.85c. Spelter is also a little higher at 13c. to 14c., but there is little movement. Tin is quotable at 35.50c.; Lake copper, 18c.; electrolytic copper, 17.50c.; Cookson's antimony, 32c. In the Joplin ore market prices were firmer with the basis range for 60 per cent zinc at $70 to $83 per ton, the top settlement being $86. Calamine was stronger at $70 to $78 for 40 per cent. Lead ore sold at $50 to $51 for 80 per cent, an advance of $5 per ton over the preceding week. Miscellaneous scrap metals are quoted as follows: Light brass, 6.50c.; heavy yellow brass, 8.50c.; heavy red brass and light copper, 10c.; heavy copper and copper wire, 12c.; zinc, 6.50c.; pewter, 20c.; tinfoil, 28c.; lead, 3.50c.; tea lead, 3.50c.

Iron and Industrial Stocks

NEW YORK, Sept. 8, 1915.

The strength of the stock market was increasingly shown in advances made in a wide range of securities in the past week. Among the most conspicuous advances in stocks of steel companies were Colorado Fuel, Virginia Iron, Coal & Coke and Cambria Steel. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chal., com.	36¼ - 40⅞	Pressed Stl., com.	58⅜ - 64
Allis-Chal., pref.	67 - 69½	Pressed Stl., pref.	100½
Am. Can, com.	57 - 60⅝	Ry. Steel Spring, com.	38½ - 39⅛
Am. Can, pref.	105 - 106	Republic, com.	41⅞ - 44½
Am. Car & Fdy., com.	67½ - 70⅞	Republic, pref.	101 - 101⅝
Am. Car & Fdy., pref.	116½ - 116¾	Rumely Co., com.	5⅜ - 6½
Am. Loco., com.	52½ - 56	Rumely Co., pref.	9⅜ - 10½
Am. Loco., pref.	97 - 97½	Sloss, com.	52¼ - 55
Am. Steel Fdries.	51¾ - 54½	Pipe, com.	19½ - 20½
Bald. Loco., com.	79½ - 83¾	U. S. Steel, com.	73¾ - 76⅝
Bald. Loco., pref.	106 - 106½	U. S. Steel, pref.	111⅝ - 113¼
Beth. Steel, com.	284 - 294	Va. I. C. & Coke.	58 - 66
Beth. Steel, pref.	140¼ - 142	West'gh'se Elec.	114⅜ - 117
Case (J. I.), pref.	78¼ 79	Am. Ship, com.	39½ - 40½
Colorado Fuel	41¾ - 48¼	Am. Ship, pref.	73
Deere & Co., pref.	93	Chic. Pneu. Tool.	77 - 78½
General Electric.	171 - 175	Cambria Steel	54½ - 59⅝
Gt. No. Ore Cert.	41¼ - 42⅝	Lake Sup. Corp.	9½ - 10¼
Int. Harv. of N. J., com.	106 - 107	Pa. Steel, pref.	81½ - 82
Int. Harv. of N. J., pref.	115½	Warwick	10
Int. Harv. Corp., com.	68 - 70¼	Cruc. Steel, com.	73⅝ - 88⅜
Lackawanna Stl.	68½ - 72	Cruc. Steel, pref.	101¾ - 105½
Nat. Enam. & Stm., com.	26½ - 29	Harb-Walk. Refrac., com.	60
		La Belle Iron, com.	40 - 43

Dividends

The American Car & Foundry Company, regular quarterly, 1¾ per cent on the preferred and ½ of 1 per cent on the common stock, payable Oct. 1.

The La Belle Iron Works, regular quarterly, 1 per cent on the preferred stock, payable Sept. 30.

The Cambria Iron Company, regular semi-annual, 2 per cent, payable Oct. 1.

The American Can Company, regular quarterly, 1¾ per cent on the preferred stock, payable Oct. 1.

The Canadian General Electric Company, regular

quarterly, 1¾ per cent on the common and 3½ per cent on the preferred stock, payable Oct. 1

The Bethlehem Steel Company, regular quarterly, 1¾ per cent on the preferred stock, payable Oct. 1.

The Continental Can Company, initial, 1¼ per cent on the common stock and regular quarterly, 1¾ per cent. on the preferred, payable Oct. 1.

PERSONAL

James W. Rawle, for many years associated with the Bethlehem Steel Company and at present vice-president of the J. G. Brill Company, has been elected a director of the Driggs-Seabury Ordnance Company.

William R. Swan, for the past five years manager of the Bridgeport, Conn., plant of the Bontempi Rust Proofing Company, has tendered his resignation to be effective Oct. 1, and has organized the Phenol & Aniline Company of Stamford, Conn. He will be secretary and treasurer of the new company, having charge of the purchasing and sales departments.

John J. Eberhard has been appointed superintendent of the Fitchburg, Mass., plant of the Simonds Mfg. Company, succeeding Gifford K. Simonds, who will give his attention to his larger executive responsibilities. Mr. Eberhard has been connected with the company for six years.

M. Burr Talmage has resigned as president of the Hydraulic Press Mfg. Company, Mount Gilead, Ohio, with which he has been connected since its organization, and Dr. N. Tucker, who was founder of the company's business, has been elected in his place. Dr. Tucker has been added to the board of directors. Other officers elected at a recent meeting of the board are W. G. Beebe, vice-president, and M. W. Spear, treasurer.

Ivor M. Williams, for fifteen years connected with the contract department of the American Bridge Company, the greater part of that time with the company's Cleveland office, has resigned and has become contracting agent of the Massillon Bridge & Structural Company, Massillon, Ohio, for the northern Ohio and Michigan territory. The latter company has opened an office at 612 Marshall Building, Cleveland.

W. E. Mathews, for two years superintendent of the Mount Braddock coke plant of W. J. Rainey, has resigned on account of ill health.

Grant D. Bradshaw, steam engineer of the Cambria Steel Company, Johnstown, Pa., has resigned, to take effect Oct. 1. He will become president of the Andrews-Bradshaw Company, sales engineer, Pittsburgh, which will make a specialty of steam and combustion equipment. Mr. Bradshaw went with the Cambria Company in 1910 as assistant steam engineer and was appointed steam engineer in the spring of 1911. He was previously connected for one year with the Indiana Steel Company, Gary, Ind., and for five years with the Illinois Steel Company. He is the inventor of the Bradshaw gas burner for blast furnace and producer gas, which, besides its use in the works of the Cambria Company, has been adopted by a number of other plants. Mr. Bradshaw expects to locate permanently in Pittsburgh.

Thomas O. Gilland, formerly of the engineering department of the Berwind-White Coal Mining Company, is now connected with the sales department of the Eastern Steel Company, Philadelphia.

S. A. Cochran of Frank Samuel, Harrison Building, Philadelphia, has returned to his desk after an absence of over a year. He went away because of ill health and has completely recovered.

As a memorial to the late Dr. Joseph A. Holmes, director of the Bureau of Mines, the Colorado School of Mines has established the Joseph A. Holmes Professorship of Safety and Efficiency Engineering.

Emmett B. Carter, chief engineer Midvale Steel Works, Philadelphia, is a member of the party of engineers scheduled to leave New York Thursday evening for a visit to the Panama-Pacific Exposition and the International Engineering Congress to be held at San Francisco.

Thomas T. Read, for several years associate editor of the *Mining and Scientific Press*, has become connected with the Engels Copper Company, Engels, Cal.

Arthur C. Terrill, formerly field representative of the New York State Museum and in charge of the collection and arrangement of the large mining exhibit of the State at the Panama-Pacific Exposition, has been appointed head of the mining engineering department of the University of Kansas, Lawrence, Kan. His title is to be Professor of Mining and Ore Dressing. He assumed his new duties Sept. 1.

Pittsburgh and Nearby Districts

The Union Switch & Signal Company, Pittsburgh, has placed contracts in the past several weeks for upward of $300,000 worth of machine tools. It is making large quantities of shells for Europe.

The American Steel & Wire Company, Pittsburgh, has recently installed twenty barb wire machines in its works at Sharon, Pa., and will add more wire-drawing equipment in the near future.

The National Fireproofing Company, Pittsburgh, which has a large plant at Hamilton, Canada, is reported to be negotiating with the Canadian Government with a view of making war munitions. If it should engage in this business it will need a complete outfit of new equipment.

The Crucible Steel Company of America, Pittsburgh, expects to start in part its new steel plant at Harrison, N. J., Sept. 13. It is erecting ten new buildings and part of the equipment has been installed, but the entire plant will not be completed for some months.

The Youngstown Iron & Steel Company, which is building an open-hearth steel plant at Lowellville, Ohio, started to make sheet bars last week, but the entire plant will not be completed for some time. The three open-hearth furnaces in the works have been in operation for several weeks.

The Three-Barrel Gun Company, Moundsville, W. Va., recently rejected a large European order for guns because the extra machinery needed to make them could not be installed in time to effect the deliveries wanted.

The Crucible Steel Company of America, Pittsburgh, is reported to have taken another order for 15,950 high explosive shells, valued at more than $10,000,000. Included in this contract are said to be 11,000 15-in. lyddite shells for the British navy. Each of these shells will cost $500. In addition the company will supply 75,000 5-in. lyddite shells, each costing $20; 55,000 6-in. shells, each costing $25; 10,000 9-in. shells, each costing $50, and 8500 12-in. shells, each costing $200. It is actively carrying out plans to make the plant at Harrison, N. J., the greatest torpedo manufacturing establishment in the country. It has a torpedo of new design, its own patent. The capacity of the plant is being rushed on that line of work, the output going largely to Great Britain.

The Moltrup Steel Products Company, Beaver Falls, Pa., manufacturer of cold drawn, milled and ground specialties, is erecting an addition to its plant for the production of high grade crankshafts. The building will be 60 x 250 ft., of concrete, brick and steel. A part of the machinery equipment is being built by the company and orders have been placed for a number of machine tools, including lathes, grinders, etc.

A special type of furnace for heating billets or ingots preparatory to rolling is the subject of a patent (U. S. 1,121,621, Dec. 22, 1914) granted to Jerome K. George, Worcester, Mass. Near the discharge end the furnace floor is inclined downward to facilitate the collection and removal of cinder, slag and molten metal that drips from the billets.

NEW TRADE PUBLICATIONS

Shop Furnaces.—American Shop Equipment Company, McCormick Building, Chicago, Ill. Pamphlet. Pertains to a line of shop furnaces that can be shipped either erected or knocked down as desired. Illustrations and brief descriptions of the furnaces which comprise portable and stationary riveting forges and flue-welding and heat-treating furnaces are presented, together with brief descriptions and tables of dimensions and shipping weights.

Welding and Cutting Metals.—Thermalene Company, Chicago Heights, Ill. Catalog. Embodies a discussion of the advantages of the oxy-thermalene method of welding and cutting metals with instructions on the operation of the gas generator and a description of the various outfits and accessories that can be supplied. Special emphasis is laid on the efficiency and safety of the gas, which is a combination of calcium carbide and hydrocarbon oils. The special advantages claimed for the use of this equipment are no waste of gas nor time waiting for gas and the elimination of depreciation of generator equipment. Illustrations and brief descriptions of the outfit and the accessories that can be furnished are included, together with a number of views of work that has been done by the apparatus. A number of tables of useful information are included.

Firebrick.—Betson Plastic Fire Brick Company, Rome, N. Y. Booklet. Tells how to construct a solid gas tight one-piece furnace lining, including the front and rear arches, side and bridge walls and combustion chamber, from plastic refractory material without the use of special forms or tools. Directions for testing boiler settings for air leaks and for the immediate repair of cracks and holes without shutting the boiler down are included. Diagrams and illustrations showing the application of the one-piece lining to the several types of boilers in general use are included.

Drill Sharpening Machine.—Sullivan Machinery Company, 122 South Michigan Avenue, Chicago, Ill. Bulletin No. 72. Illustrations and descriptive matter explain the operation of a drill sharpening machine which was illustrated in THE IRON AGE, June 10, 1915. It is a compressed air machine for forging and sharpening rock drill and hammer drill bits and forming shanks by hammering. In addition to a general view of the machine a number of others are presented of the different parts as well as of the machine itself in use. Views of the several types of bits that can be sharpened on the machine, together with some of the dies employed, are included.

Water Tube Boilers.—A. D. Granger Company, 90 West Street, New York City. Bulletin No. 2, sixth edition. Describes and illustrates a self-contained internally fired water-tube boiler. The particular advantages claimed for the boiler are small floor space, great fuel economy, rapid production of steam and ease of repairs. Both the high and low-pressure types of boilers are illustrated and tables of specifications presented. Views of the grates used and a number of buildings in which these boilers have been installed are included.

Cutting Lubricant.—Crescent Oil Company, 30 Church Street, New York City. Booklet. Describe some of the practical uses of Aqualene, which is a water soluble oil that can be used with large proportions of water as a cooling agent, or as a lubricant for the slides, bearings and other working parts of the machine on which it is used as it posseses sufficient density. Among the machines on which it is used are automatics, turret lathes, bolt and automatic gear-cutting machines, grinding machines and other tools. The uses of the lubricant are shown by photographs of actual machines upon which it is used, the engraving in each case being supplemented by a brief statement of the work that is being done, the proportions of water and lubricant used and the results secured.

Gas Pumps and Exhausters.—Connersville Blower Company, Connersville, Ind. Catalog No. 17. This is the company's latest catalog describing and illustrating a line of gas pumps and exhausters. A detailed discussion of the possible losses of the rotary, turbo and piston types of pumps is presented, followed by descriptions of the company's standard machines, including tables of general dimensions, speeds and displacement. A number of views of actual installations of the pumps are presented and the description is supplemented by line and halftone engravings of some of the special features.

Ammonia Fittings and Supplies.—Henry Vogt Machine Company, Inc., Louisville, Ky. Catalog. Size, 6 x 9 in.; pages, 95. Describes chiefly by illustrations and dimension tables a complete line of fittings and supplies for ice and refrigerating machinery. This includes valves of various types, fittings and flanges, packing rings, coolers, pumps, gauges, coils and boilers. A number of tables of useful information completes the catalog.

Steel Building Construction.—Ferguson Steel & Iron Company, Inc., Buffalo, N. Y. Pamphlet. Contains a series of photographs illustrating the different phases in the construction of a steel building 100 x 600 ft., with 100-ft. trusses, which was fabricated and erected in less than six weeks. In addition to the photographs a brief chronological statement of the progress made on the work is included.

Chains and Chain Hoists.—Clinton E. Hobbs Company, Boston, Mass. Folder. Presents a number of illustrations of various types of chains and link belting that can be supplied in a wide range of sizes. The line includes machine, coil, roller, sling, cable, quarry and dredge styles. Illustrations of worm, geared and triplex chain hoists are included.

Track Bolt Nuts.—Ballou Safety Rail Joint Company, Inc., Roanoke, Va. Pamphlet. Calls attention to a safety track bolt nut which is claimed to strengthen the threaded portion of the bolt as well as being held so tightly that it will not loosen as a result of the vibraton to which it is subjected. Mention is made of an insulated joint and a number of drawings showing the use of the nuts and joints are included.

Hollow Tile.—Pennsylvania Fireproofing Company, Erie, Pa. Pamphlet. Refers to a hollow building tile with a rough texture surface for use in the exterior walls of factories, warehouses, garages, etc. A number of illustrations of the different shapes of tile that can be supplied are presented, as well as views of buildings that have been constructed with this material according to the Barr system of factory construction, which was illustrated in THE IRON AGE, April 22, 1915.

Metal Building Products.—Trussed Concrete Steel Company, Youngstown, Ohio. Form D-208. Illustrates and describes a line of metal building products which includes lath of various types and pressed steel studs, corner beads and base screeds for constructing roofs, sidewalls, partitions and ceilings, and in connection with interior and exterior plastering and stucco work. In addition to the illustrations of the products themselves a number of views are presented of them in use.

Special Steels.—International High Speed Steel Company, 99 Nassau Street, New York City. Booklet. Devoted to a line of high-speed tool and special alloy steels which can be supplied in bars, strips, coils and sheets. The various grades are briefly described with concise statements of the work for which they are suited and brief instructions for heat treating. A list of the carbon temper numbers and the forging and hardening heats is included, together with a reproduction of the color scale of heats and the tempering colors. Mention is made of a line of mining and rock drill steel with directions for heat treating and tables of weights. Other steels that can be supplied are listed, together with the heat treatments recommended by the Society of Automobile Engineers. A number of tables of useful information are included.

Alloy Bronzes.—Titanium Alloy Mfg. Company, Niagara Falls, N. Y. Pamphlet. Illustrates and describes the facilities of the bronze department of this company for producing titanium-aluminum bronze and other standard bronze castings. The material in the pamphlet is a reprint of an article which appeared in the July, 1915, number of *Foundry*, describing the company's plant.

Turbo-Undergrate Blowers.—B. F. Sturtevant Company, Hyde Park, Boston, Mass. Mailing card. Concerned with a turbo-undergrate blower for increasing draft and enabling cheaper grades of coal to be burned as fuel. An illustration of the blower is presented and a specific case is cited where the installation of one of these blowers eliminated the necessity of extending a brick stack 20 ft.

Lighting Conduit.—Enameled Metals Company, Pittsburgh, Pa. Two folders. Deal with lighting conduits that can be furnished with either an enameled or galvanized finish. Special emphasis is laid upon the thread protectors that are used with the enameled conduits to insure the threads on the pipe ends and inside the couplings being clean when it is desired to use the conduits. A series of illustrations showing the way in which these protectors can be removed is included together with a table of the sizes of conduits, couplings and elbows that can be supplied.

Bevel Gears.—Gleason Works, Rochester, N. Y. Pamphlet. Relates to a special style of bevel gears known as the spiral type in which the teeth are curved on the arc of a circle. The special advantages claimed for these gears are quietness, due to the overlapping of the teeth which roll on to each other in a manner somewhat similar to the worm and worm gear, one pair of teeth coming into engagement while the preceding pair is still in contact, endwise adjustment of the pinion without introducing noise or spoiling the bearing and a heavy tooth bearing at the center of the

face which is increased slightly toward either end. The load-carrying capacity and efficiency of the gears are touched upon, and mention is made of the care that must be taken in mounting these gears to allow for the extra thrust caused by the spiral teeth, the text being supplemented by a number of line drawings. Among the applications mentioned of these gears are automobile work and machine tools where high speed coupled with quietness is required.

Chucks.—Westcott Chuck Company, Oneida, N. Y. Catalog No. 200. Treats of a line of lathe and drilling machine chucks that are made in a number of different styles. For the most part a single page is given to each type of chuck with an engraving, brief description and condensed table of specifications. Some of the engravings are made in the phantom style to illustrate the construction.

Magnet Cranes.—Industrial Works, Bay City, Mich. Bulletin No. 204. Shows a number of cranes equipped with lifting magnets for handling steel plates, rails, scrap, pig iron and other magnetic metal products. The illustrations in the bulletin are of cranes in actual use and these are supplemented by a number of smaller engravings of the magnet itself lifting a variety of metal products.

Pumping Machinery.—Advance Pump & Compressor Company, Battle Creek, Mich. Two collections of loose leaf bulletins. The first illustrates and describes briefly a line of reciprocating pumps for various uses, such as boiler feed, tank, waterworks, air, fuel oil and general service. A separate bulletin is given to each different type of pump with an illustration, brief description and condensed table of specifications. The other pertains to a line of centrifugal pumps that are made in both vertical and horizontal types for belt, motor or engine drive. Mention is made of the various accessories that can be supplied for these pumps and a diagram showing various discharge arrangements that can be supplied is included. Instructions for the installation and operation of these pumps are presented, the text being supplemented by a number of line drawings. In both collections of bulletins a number of tables of useful information are included.

Drop Forgings.—Lakeside Forge Company, Erie, Pa. Catalog O. Pertains to a line of drop forged wrenches and other stock specialties, including crankshafts, eyebolts, sawmill dog teeth, etc. The various types of wrenches shown include single and double-end engineer's, cap and set screw, car, general purpose, automobile, structural, construction, track, tool post, adjustable and pipe styles as well as several special combination types. All of these are illustrated and tables of the sizes in which they can be supplied are included. Mention is made of the special drop forging work that can be turned out in addition to the lines illustrated and a partial list of this work completes the catalog.

Corrugated Asbestos Sheathing.—Keasbey & Mattison Company, Ambler, Pa. Pamphlet. Lists a line of corrugated asbestos sheathing for use as roofing, siding, awnings, etc. After a brief description of the material which was illustrated in THE IRON AGE, Aug. 19, 1915, its application is gone into at some length, the text being supplemented by numerous line and halftone engravings showing how the sheets are put on. There are also a number of views of buildings where this material has been used in various forms. Mention is made of other asbestos products, such as building lumber and shingles and drawings showing the different effects that can be secured with the latter are included.

Transmission Gears.—Foote Bros. Gear & Machine Company, 216 North Carpenter Street, Chicago, Ill. Pamphlet. Illustrates a special type of transmission gear that has been developed for use on traction engines. Two forward speeds and one reverse speed are obtained and it is possible to arrange the gear with the motor set on one side of the case or with it parallel, the transmission being through bevel gears in the latter case. The various features of the gear are touched upon and there are a number of drawings showing the way in which the transmission can be applied to tractors with various types of connections.

Bar Bending Tools and Shelf Brackets.—Wallace Supplies Mfg. Company, 412 Orleans Street, Chicago, Ill. Two folders. The first shows a line of bar bending tools for bending plain square, round, or square-twisted bars into various shapes and for the cold bending of eyes. All of the different machines are illustrated and briefly described and drawings showing some of the work that has been done by them are presented. The second folder contains illustrations showing the use of a steel shelf bracket in connection with iron pipe upright standards. The advantages claimed for the use of these brackets are interchangeability and adjustability. Directions for assembling a set of shelves using iron pipe standards and these brackets are included.

Rails and Track Fastenings and Light Steel Shapes.—Sweet's Steel Company, Williamsport, Pa. Catalog. Illustrates a line of rails and track fastenings and light steel shapes such as angles, channels, plain and twisted bars, etc. In addition to the illustrations of the various rails and fastenings tables are given showing the quantity of material required for 100 tons of rails and one mile of single track, as well as the amount of track 100 gross tons of rail will lay. Tables of the various sizes of angles and bars are included.

Optical Instruments.—Bausch & Lomb Optical Company, Rochester, N. Y. Catalog. Pertains to a line of optical instruments for inspection and testing of materials. These include microscopes of various types, photomicrographic cameras and apparatus, metallographic equipment and oil testing instruments, all of which are illustrated. Accessories such as objectives, eyepieces, illuminating apparatus, specimen holders, etc., are mentioned and briefly described.

Metal Sheets.—American Rolling Mill Company, Middletown, Ohio. Pamphlet, entitled, "Armco Iron Rust-Resisting Products." Contains illustrations and brief descriptions of the various products made from Armco American Ingot Iron. These include corrugated sheets of either black, painted or galvanized iron, roofing of various kinds, plain and fancy siding and shingles, metal lath, conductor pipe and elbows, roof gutters, etc. All of these are illustrated and briefly described and a number of views are included showing the products in use. Mention is also made of a line of sheet metal crates that have been developed for handling export shipments and a partial list of the uses to which American Ingot Iron can be put completes the booklet.

Alligator Shearing Machines.—Canton Foundry & Machine Company, Canton, Ohio. Catalog. Contains illustrations with condensed specification tables of a line of alligator shearing machines of the low and high knife and portable types. The advantages of using these machines from the viewpoints of increased earnings, storage space and service to customers are briefly touched upon and special emphasis is laid upon the desirability of using motor-driven machines. A brief comparison of the classes of work that the low and high knife machines will handle to the best advantage is included.

Air Compressors.—Gardner Governor Company, Quincy, Ill. Circular A-C 12. Contains condensed suggestions for the installation of the air lift system of water pumping and some descriptive data of the various types of air compressors that are suitable for this work. In connection with the descriptive data illustrations of the various machines are presented.

August Industrial Accidents in Pennsylvania

Industrial accidents in August in Pennsylvania numbered 5588, according to a report issued by the Bureau of Statistics of the Department of Labor and Industry. Eighty-four men were killed and 249 were seriously injured. Of this latter number two were women. In the metal trades there were 13 killed and 2463 hurt; mining, 56 killed and 1179 hurt; repair shops, 3 killed and 1455 hurt. Seven men were killed in an explosive plant, three in building and one each in textiles and clay works.

Commenting on the greater number of accidents in August than in preceding months, the report attributes the increased number to the rush of war orders. It was particularly in the metal trades that a large increase in the number of accidents was reported. Compared with the 5588 accidents in August, there were in July 5083, May 5008, April 3980.

Removing the Rings in Rotary Kilns

A proposed method of removing the rings of slagged material accumulating in rotary kilns used for nodulizing iron ores is offered by Francis B. Dutton of Lebanon, Pa., in a patent (U. S. 1,117,814) granted to him. He would introduce water under pressure against the surface of the adhering ring. This is accomplished by arranging a series of water pipes along the length of the kiln, the pipes being connected with a header and extending through the wall of the kiln. Water thus introduced under pressure would come in contact with the surface of the hot slagged mass and by the generation of steam, as well as by the force of the water, the accumulation would be dislodged. The operation would be performed in a short time, would not allow the kiln to cool substantially and would eliminate manual labor in the removal of the rings.

The United States District Court at Chicago has ruled in a Chicago store case that a patentee manufacturer can fix the resale price. It will be appealed.

Machinery Markets and News of the Works

MORE LATHES AVAILABLE

Some Falling Off in Foreign Inquiry

Demand for Tools Apart from War Orders Continues Heavy. Plants Extending Inquiry for Second-hand Equipment Strong

The long deliveries on lathes have resulted in cutting down the foreign inquiries before the trade in practically all of the markets where export business is being done. Automatic screw machines of the multiple-spindle type and turret lathes cannot be delivered before the end of this year and in some cases the time for delivery is as late as April or May of next year. One large foreign purchaser recently gave instructions not to consider any deliveries beyond April. At the same time the lathes that are being made under contract outside of the builders' shops are beginning to make their appearance on the market. In general, the domestic market is broadening, due to plant extensions and the generally crowded condition of the automobile factories.

In the New York market considerable inquiry has come out for turret lathes and some deals have been closed, the purchasers including two railroad lines and a Government arsenal, a powder company and two industrial plants. The purchase of the tools for the new shops of the Lehigh & New England Railroad has been postponed for the present.

Fewer foreign orders for machine tools are being placed at Cleveland on account of the delayed delivery. This fact does not interfere with the domestic demand which is heavy. The Hydraulic Pressed Steel Company has received a sub-contract from the Baldwin Locomotive Works for 2,500,000 forged shrapnel shells for Russia. This is the largest shell order placed in that city since the commencement of hostilities, and will necessitate a further enlargement of the company's plant. The Henkle Company, Fremont, Ohio, is inquiring for 100 machine tools, including twenty turret lathes and ten screw machines, but the purpose of the inquiry is not given. Another inquiry before the trade is for twenty to twenty-four 16-in. lathes. Automobile work is keeping the forging plants, which are usually dull at this season, busy.

Inquiries for equipment of all kinds are coming out at Chicago, due to the extensions of plants in a great variety of enterprises. In this market the entire equipment of machine shops continues to be bought for resale purposes.

At Cincinnati the general belief is that the high point of the foreign demand has been passed, the reason for this belief being based in part on a slackening in the demand for export tools. Here, as elsewhere, the long delivery period operates against the placing of orders. At the same time practically all the machine tool builders have contracts that will keep their plants operating well into next year. Many of the shops are now working on old contracts taken before the price of machine tools and wages were advanced and in some instances bonuses are being paid to increase production.

At Detroit the automobile industry is operating at full capacity and the Scripps-Booth Motor Company has begun work on the erection of a three-story building to give a daily output of 100 cars. The market for machine tools is broadening and includes second-hand equipment as well as new standard machines.

The machine-tool business on the Pacific coast is reported to be limited more by lack of stock than of demand. The tools which were ordered some months ago are being received, but are practically all sold before leaving the factory. The employment of Eastern shops on war business is being felt in the diversion of occasional orders for miscellaneous equipment to Pacific coast manufacturers. Several Baltimore companies have banded themselves together to secure orders for shrapnel cases and other war materials, and a new company has been incorporated with a capital stock of $3,000,000 to handle munition contracts recently secured by the Bartlett-Hayward Company.

New York

NEW YORK, Sept. 7, 1915.

More numerous offerings of lathes made under contract outside of regular machine-tool shops are appearing in this market. One dealer, for instance, can make delivery of thirty such machines in October, fifty in November and fifty in December. It is not proposed to sell them singly, but in groups of ten or more. A local printing press manufacturer is putting through a lot of 100 lathes. Inasmuch as there are many concerns engaged in this work, here and elsewhere, the trade has come to speculating as to the extent to which these machines will affect the market when the pressure for machine tools passes. In this connection, it is not doubted but that European manufacturers have been abnormally busy building machine tools. Just now most domestic builders are struggling to make the deliveries called for by contracts. One or two dealers admit that they are falling a little behind. The best deliveries that makers of turret lathes can give run from the end of the year until next April or May, and the same is true with makers of automatic screw machines of the multiple spindle type. One of the very large purchasers for export has received cabled instructions from abroad not to consider any deliveries beyond April. This advice was received on the first of this month.

Some inquiry only indirectly associated with the war has come from Australia and New Zealand. With most houses inquiry from the industrial field is light, although a few manufacturers are arranging for deliveries of one or more tools next spring. Among those who have inquired for or purchased tools, to a great extent turret lathes, are the Union Pacific Railroad system, the General Electric Company, the Central Railroad of New Jersey, the Dupont Powder Company, the American Type Founders Company and the Frankford Arsenal.

The Eddystone Munitions Company, Eddystone, Pa., has placed orders for a variety of machine tools such as are required in shell work, delivery to be made in February and March.

It is reported that the Central Machinery & Supply Company, New York, is interested in new equipment for its manufacturing plant at Paterson, N. J.

For the time being the Lehigh & New England Railroad has postponed purchasing tools for its new shop at Penn Argyle, Pa.

The shortage of brass rods for shrapnel fuse timers has led to the use of several substitutes, among which are brass

castings, steel, Tobin bronze, phosphor bronze and even aluminum. Die castings have been used for certain of the parts and with these the powder train groove does not have to be machined. It is said of shell-making, in general, that practically all of the early specifications have been abandoned, the one important qualification that is adhered to being the tensile strength of the casings. Methods of manufacture differ in practically every shop where shells or their parts are made.

There is a growing demand for extruded metal, and it is surmised that it is used in some part of the manufacture of munitions. The Watson-Stillman Company, Aldene, N. J., has received a number of orders for metal extruding presses, both from foreign and domestic sources.

The Turner Construction Company, Prudential Building, Buffalo, and 11 Broadway, New York, has been awarded the contract by Shuttleworth Brothers Company, Amsterdam, N. Y., for the construction of two buildings for the manufacture of carpets, one a mill six stories, 62 x 243 ft., of flat slab type of construction; the other a dyehouse six stories, 54 x 170 ft., of beam and girder type. The buildings are to be of reinforced concrete construction throughout with brick curtain walls, double glazed windows and wood floors; F. P. Sheldon & Son, Providence, R. I., are the architects and engineers. Work will be undertaken at once.

The Tropenas Converter Company, 50 Church Street, New York, is in the market for a testing machine, preferably second-hand, of from 100,000 to 200,000 lb. capacity. G. Muntz is general manager.

The Sterling Automobile Company, Paterson, N. J., recently organized, has leased 12,000 sq. ft. of floor space in the Lynch mill on George Street, where it is reported it will manufacture motor cars. Edward J. and William Adelson, Henry Hyman and Charles Chambers of New York City are the organizers.

A workshop, 25 x 40 ft., with two wings each 29 x 63 ft., is to be erected by the Bloomingdale Asylum for the Insane, White Plains, N. Y.

The Benford Mfg. Company, Mt. Vernon, N. Y., will build an addition to its plant to cost $15,000.

The Nunda Electric Light Company, Nunda, N. Y., has been incorporated and will equip a plant for the production of heat, light and power.

The Niagara Automobile Company, Buffalo, has been incorporated with a capital stock of $750,000 and will manufacture automobiles. Preparations for the equipment of a plant at Main and Carlton streets, Buffalo, are being made. G. H. Poppenberg is president and William J. Miller is vice-president and general manager.

The Columbia Postal Supply Company, Silver Creek, N. Y., is taking bids for a one-story and basement factory, 65 x 85 ft. M. McCarthy is manager.

The Gould Storage Battery Company, Depew, N. Y., has let contract for the construction of the two-story addition, 75 x 200 ft., to its plant and work has been commenced.

The Kingston Factory Corporation, Kingston, N. Y., is taking bids for erection of a factory building, 50 x 150 ft., two stories and basement.

The Defiance Paper Company, Niagara Falls, N. Y., is taking bids for a one and two-story pulp mill, 66 x 82 ft., to be added to its plant.

The T. J. Mfg. Company, Malone, N. Y., has been incorporated by C. L. Johnson, C. E. and R. Tallman, Ogdensburg, N. Y., to manufacture paper boxes, store fixtures, etc.

The Crandall Stone Company, Binghamton, N. Y., has let contract for a four-story addition to its plant, 40 x 100 ft.

The Taylor Instrument Companies, 95 Ames Street, Rochester, N. Y., have let contracts for the erection of a boilerhouse and stack, 58 x 70 ft., to cost $10,000. Plans have been prepared by A. S. Crocker, Mechanics Institute, Rochester.

The Ferguson Steel & Iron Company, Buffalo, has received the contract for the building of boiler house and erection of an addition to plant of the Curtis Aeroplane Company, Buffalo, to cost $50,000.

The N. C. Clausen Architectural Iron Company, Tivoli Street, Albany, N. Y., recently increased its capital stock from $5,000 to $20,000. The increased capitalization was arranged principally to carry out the contract work which the company has on hand and not for the enlargement of its plant, although the outlook is such that it is confidently expected that the business will steadily continue to grow. The similarity of the name of this company with that of the H. C. Clausen Architectural Iron Company, East Seventy-fourth Street, New York, led to a regrettable error in an item published in THE IRON AGE on page 496 of the issue of Aug. 26.

New England

BOSTON, MASS., Sept. 6, 1915.

The striking part of the news of the past week is the increasing number of prosperity reports from New England's industrial towns and cities. These reports are the more interesting because they reflect an increasing general prosperity, not prosperity based on direct war orders. One such report comes from Hartford, Conn., based upon figures compiled by Thomas J. Kelley, secretary of the Manufacturers' Association of Hartford County. His report shows a gain of 3000 hands and an increase of nearly 2,000,000 ft. of floor space made by Hartford manufacturers since Jan. 1. The number of skilled laborers is placed at 21,500, the largest gain being in the tool and machine plants, where the number of employees has been increased from 4225 to 6500. The screw-making industry has almost doubled its payroll since 1912, going from 785 to 1500 employees, and in the same period the number of hands engaged in the valve industry has increased from 400 to 750.

Among the plants which were lying idle on Jan. 1, and have since been occupied are those of the Pope Mfg. Company, the Columbia Motor Car Company, the Pope West Works, the Universal Screw Company, the Hartford Foundry Company and the Parker Motor Company. New plants or additions have been or are being erected by the Pratt & Whitney Company, the Billings & Spencer Company, the Hartford Special Machinery Company, the Jacobs Mfg. Company, Hartford Machine Screw Company, the Whitney Mfg. Company, the Taylor & Fenn Company and the Austin Organ Company.

Springfield, Vt., is enjoying the busiest times ever known. The Jones & Lamson Machine Company has awarded a contract for the erection of a hardening shop and steelroom to be built of steel, brick and concrete, 120 x 125 ft., one story. It is reported that this concern is sold ahead on its lathe output until next April. The Vermont Snath Company has moved into a new foundry, the Springfield Brass Company has started a new iron foundry and the Fellows Gear Shaper Company is building an addition. All of these plants as well as that of the Bryant Chucking Grinder Company are employing night shifts.

The textile machinery plants report better conditions. The Whitin Machine Works, Whitinsville, Mass., which has been very busy of late, has announced a new working schedule of 55 hr. a week and an increase of pay.

The mystery which existed for a time concerning the identity of the purchaser of the Westfield, Mass., plant of the Pope Mfg. Company, has been cleared up by the incorporation of the Westfield Mfg. Company and the publication of its personnel. Wilbur C. Walker, Hartford, Conn., is president and Charles H. Tenney, Springfield, Mass., president of the Springfield Gaslight Company and head of the Tenney public service corporations, is chairman of the board of directors. Other directors are: Stephen C. Millett, treasurer of the New York banking company of Millett, Roe & Hagen; O. J. Thomen, New York, of Redmond & Co., bankers, and Joseph Shattuck, president of the Third National Bank of Springfield. The new charter of the company permits it to deal in and manufacture guns and ammunition. It is understood that no change is to be made in the local management of the plant.

It is reported that an option has been secured on land in Bristol, R. I., for a shipbuilding plant for the construction of cargo and Government vessels to cost $1,000,000. The report states that Sir Thomas Lipton, Nathaniel G. Herreshoff and New York and Bristol capitalists are back of the project.

Building continues active in Waterbury, Conn. The new factory of the American Brass Company on Washington Avenue will be built of steel and brick and will be 160 x 224 ft., one story. The Scovill Mfg. Company has awarded the contract for a building on Mill Street, 28 x 50 ft., with a wing 11 x 25 ft., one story.

The Union Twist Drill Company, Athol, Mass., has denied that it is engaged in the manufacture of war implements, stating that it has been caused much inconvenience by the published statements to that effect. Due to the increase of business in regular lines, 25 men have been added to the night shift.

The G & O Mfg. Company, New Haven, Conn., has been incorporated with an authorized capital of $20,000. The incorporators are Frederick Gargiulo, Charles Oppe and Salvator Gargiulo of New Haven. It has purchased the entire manufacturing equipment of the Special Machinery & Tool Company, New Haven, and is fitting up its new plant at Wall and State streets to do contract machine work and manufacture automobile specialties. It desires to get in touch with any companies having machine tools for sale. S. Gargiulo is president, F. Gargiulo is treasurer and C. Oppe is secretary.

The new buildings of the Asa S. Cook Company, Franklin Avenue, Hartford, Conn., will consist of a machine shop, 70 x 210 ft., one story, and an office building, 40 x 95 ft., two stories.

The American Can Company is erecting an addition to its plant at Lubec, Me., to cost about $100,000.

The Eastern Bridge & Structural Company, Worcester, Mass., has been awarded the contract to supply the steel for the new building of the New England Westinghouse Company at Chicopee, Mass.

The New England Westinghouse Company, Springfield and Chicopee, Mass., has given its employees an 8-hr. day without reduction of pay. This is in line with the concessions made by other New England plants whose present business consists largely of rush war munition orders.

Baltimore

BALTIMORE, MD., Sept. 6, 1915.

Six well-known Baltimore companies have banded together under the name of the Munitions Supply Company to secure war orders. It is stated that they are not merged, but simply working together to get orders for shrapnel cases and other war materials. The affiliated companies are the F. S. & G. L. Brown Machine Company, 20 to 26 East Fort Avenue; John B. Adt Company, 326 to 344 North Holliday Street; Sinclair-Scott Company, Wells and Patapsco streets; E. J. Codd Company, 700 South Carline Street; Page Engineering Company, Clagett and Hull streets, and Charles White Gas Engine Company, Charles and Winder streets. It is said that Crook-Kries & Co. also are interested in the plan. The new company has an office at 60 Wall Street, New York. The local organization has been handled by W. W. Lanahan & Co., bankers, Calvert Building.

Articles of incorporation for the new company which is to handle the ammunition feature of the Bartlett-Hayward Company, Scott and McHenry streets, Baltimore, have been filed. It will be known as the Baltimore Metal Company and will have a capital stock of $3,000,000. It has a large war order and is rushing work on a number of buildings, some at Dundalk, Md.

The Cowan Building Company, 106 West Madison Street, has a contract for the construction of a machine shop for the Poole Engineering & Machine Company, Woodberry, Md., to cost $80,000. It will be approximately 150 x 390 ft., and it is understood the company is considering other improvements.

Big extensions and improvements are expected to be begun in the near future by the Spedden Shipbuilding Company, Boston Street and Kenwood Avenue, Baltimore.

The Baltimore Tube Company, Wicomico and Ostend streets, Baltimore, will construct a one-story tube mill, 77 x 141 ft., on Wicomico Street, near Bayard Street, of brick construction, to cost about $100,000.

The Maryland Steel Company, Sparrows Point, Md., is receiving bids on the construction of a one-story machine shop, 180 x 425 ft., for the marine department. A great deal of machinery, including an electric crane, will be installed.

An addition to cost about $2,000 will be constructed by the Federal Electric Welding Company, Philpot and Thames streets, Baltimore.

The Curtis Bay Distillery Company, Curtis Bay, Md., a subsidiary of the United States Industrial Alcohol Company, New York City, has purchased another tract of land with waterfront rights at Curtis Bay. A denatured alcohol plant is being constructed to cost about $1,000,000, and when completed will be the largest in the country.

The Baltimore Drydocks & Shipbuilding Company, Baltimore, is planning extensions and is negotiating with the Government to secure land at Fort McHenry. It is said that it has a plan to construct a drydock to accommodate ocean-going vessels. Holden A. Evans is superintendent.

Work on a coal pier at Curtis Bay, Md., is expected to be started in the near future by the Baltimore & Ohio Railroad Company. Plans prepared by the engineers of the railroad company call for a pier about 700 ft. long with 2000 tons capacity per day, to be erected at a cost of about $1,000,000.

It is stated that the Crown Cork & Seal Company, Baltimore, is planning to erect a foundry at its Guilford Avenue plant after plans prepared by Otto G. Simonson, architect, Maryland Casualty Tower Building, Baltimore.

The construction of a civil engineering building for the Johns Hopkins University, Baltimore, is expected to begin this month. The building will be the third of an engineering group, the mechanical engineering building and a power plant having been completed some time ago. Plans also are being made for a new chemical laboratory. Joseph Evans Sperry, Calvert Building, Baltimore, is the architect. W. Graham Boyce is treasurer of the university.

The three-story factory, a boilerhouse, peeling house and office building of the Talbot Packing & Preserving Company, Cordova, Md., were destroyed by fire Sept. 3. The loss will be about $50,000. All the machinery, which was new, was lost.

The site formerly occupied by the plant of the National Tube Company, at New Castle, Del., has been surveyed and there are rumors that a new industry will be started.

The E. I. DuPont De Nemours Company, Wilmington, Del., has been incorporated with a capital stock of $240,000,000 for the purpose of manufacturing and dealing in powder, dynamite, etc., and to erect factories, mills and other buildings. The incorporators are Pierre S. DuPont, John J. Raskob and John P. Laffey. The papers have been filed at Dover, Del.

The Union Arms & Ordnance Company, Wilmington, Del., has been incorporated with $5,000,000 capital stock by J. H. Nixon, Clarence J. Jacobs and Harry W. Davis.

The American Arms Corporation, Brooklyn, N. Y., capital stock $10,000,000, has filed its charter at Dover, Del. The incorporators are Tracey S. Buckingham, Allen E. Moore and John J. Jansen, all of Brooklyn.

The Norfolk & Western Railway will install motors for the operation of its pumps at Fink, Va. The contract for the installation has been let to the Southwestern Engineering Company, Bristol, Va. The Norfolk & Western will build a large addition to its framing-shop at Roanoke, Va. The Virginia Bridge & Iron Company, Roanoke, has the contract for the structural steel for the shop, costing about $25,000. J. E. Crawford, Roanoke, is chief engineer.

The Northern Virginia Power Company, Winchester, Va., will increase its hydroelectric developments on Cacapon River, near Berkeley Springs, W. Va., by the installation of an additional water-wheel.

Philadelphia

PHILADELPHIA, PA., Sept. 7, 1915.

A reassuring indication in this vicinity is that the plans filed and permits granted for new buildings in and near Philadelphia in August showed a substantial increase. Most of the buildings were for dwelling purposes, but the activity nevertheless shows that confidence is stronger and that money is easier. The building trades have been slow for many months.

Philadelphia territory is not without its share of strike troubles. One of the latest reports concerns a strike of about 700 carpenters who were at work on fifteen buildings which are being erected for the Remington Arms Company of Delaware by the Baldwin Locomotive Works at Eddystone, Pa. The men demand an 8-hr. day and recognition of their union. Other troubles of the kind are reported to be simmering.

Through J. P. Morgan & Co., the Baldwin Locomotive Works interests have received another large order for munitions to be supplied to Great Britain. S. N. Vauclain, vice-president of the works, admitted that the order has been received, but declined to discuss the amount involved. It is believed to be large.

The William Steele & Sons Company, 1600 Arch Street, Philadelphia, has been awarded a contract for the construction of a four-story reinforced concrete factory building, 74 x 225 ft., and having two wings, one 60 x 160 ft., and another 48 x 127 ft. The building, which is to be erected for the Bennet-Aspden Company, will cost $100,000. The location is Pechin Street and Krams Avenue.

The Fred A. Havens Company, Philadelphia, has been taking bids on alterations and additions to the plant of the Southwark Foundry & Machine Company, Fifth Street and Washington Avenue, Philadelphia, for which Jansson & Abbott, Pittsburgh, Pa., are the architects.

Bids were taken Sept. 7 on a three-story factory building, 60 x 100 ft., for the Lambertville Rubber Company, Lambertville, Pa., for which Ballinger & Perrot are the architects.

A permit has been granted to the Philadelphia Steel & Forge Company, Milnor and Bleigh streets, Philadelphia, for the construction of a factory addition, one story, frame and iron, to cost $1,000. The company itself will erect the building.

Estimates are being taken for the construction of a new plant for the Touraine Motor Car Company, Twentieth Street and Montgomery Avenue, Philadelphia. How soon work will be started has not been announced. The building contemplated will be six stories, 95 x 250 ft. and of fireproof construction.

An item in THE IRON AGE of Aug. 26 erroneously stated that the plant of the Colebrookdale Iron Company, Pottstown, Pa., whose operations were resumed Aug. 18, had been damaged by fire, whereas the damage was done by flood.

The Franklin Mfg. Company, Philadelphia, manufacturer of a patented stop and waste cock is contemplating a removal to new and larger quarters.

The Morton Truck & Tractor Company, Harrisburg, Pa., has increased its capital stock from $100,000 to $1,000,000. The actual increase notice filed with the Secretary of the Commonwealth, however, was from $100,000 to $420,000. The company is busy on large orders for tractors from the Russian Government.

The Sheldon Axle & Spring Company is the new corporate name of the Sheldon Axle Company, Wilkes-Barre, Pa. The addition was made to the name because vehicle springs have become a large part of the company's business.

Chicago

CHICAGO, ILL., Sept. 6, 1915.

Plant extension in a wide variety of enterprises is a marked feature of the present situation and is the occasion for inquiry for equipment of all kinds in no inconsiderable proportions. The Haynes Automobile Company, Kokomo, Ind., has already purchased power equipment and will buy machine tools to be installed in new buildings. The Fuller & Sons Mfg. Company, Kalamazoo, Mich., is buying gear-cutting, milling and drilling machines and other special tools for transmission manufacture. The Michigan Crown Fender Company, Ypsilanti, Mich., is in the market for a heating system, enameling ovens, a full assortment of sheet-metal-working machinery and electrical machinery.

At Chicago the machinery trade is still a repetition of what it has been in past weeks. The H. A. Stocker Machinery Company, Chicago, has purchased for re-sale the entire machine shop equipment of the W. S. Nott Fire Engine Company, Minneapolis. The local office of the Department of Commerce, Room 629, Federal Building, is inviting to a conference with J. A. Massell, who has been investigating market conditions for machinery and machine tools in South America, all those who are interested.

A new plant which will cost about $200,000 is to be erected for the Wheeling Corrugating Company, Wheeling, W. Va., at the southwest corner of Arthington Street and Campbell Avenue, Chicago. A. W. Crotsly will be resident manager.

John Anderson is building a two-story brick factory, 25 x 125 ft., to cost $6,000, at 24 South Peoria Street, Chicago. The architects are Forsman & Jebson.

William F. Pagets, 19 South La Salle Street, Chicago, is building a two-story factory on Grand Avenue at a cost of $20,000.

The Marshall Motor Company, Marshall, Ill., has been incorporated with a capital stock of $12,500 by Albert and Bertha Sockler and A. L. Ruffner and will equip a machine and repair shop.

The Wright Brothers Light & Power Company, Ramsey, Ill., has been incorporated with a capital stock of $18,000 by Alva R., Raymond C. and J. J. Wright and will equip a public service plant.

The Moline Forging & Mfg. Company, Moline, Ill., has been incorporated with a capital stock of $12,000 by Harry Ainsworth, Caldwell R. Rosborough and Arthur L. Warnen.

The National Engineering & Tool Works, Oak Park, Ill., has been formed by Walter H. Storm, Frank W. Hack and Theodore P. Schustek, with a capital stock of $9,000.

The Interstate Light & Power Company, Galena, Ill., has under consideration the addition of a 3500-hp. turbine, boilers, pumps and automatic stokers.

William McK. Brown, Cahokia Building, East St. Louis, Ill., is taking bids on a waterworks plant for the town of Sparta, Ill., to cost $60,000.

The Barrows Lock Company, Lockport, Ill., will build an addition to its plant.

Fire totally destroyed the factory buildings of the Moline Malleable Iron Works, St. Charles, Ill., causing a loss of $150,000.

The Twin City Four Wheel Drive Company, recently incorporated, will build a new plant at once at St. Paul, Minn. It will be three stories, of reinforced concrete, and will be equipped with the latest machinery.

The Illinois Central Railroad is to build a new roundhouse at Cherokee, Iowa. In addition to eleven new stalls there will be engineers' room, washroom, a machine shop and two modern drop pits. The total cost will be about $52,000.

Milwaukee

MILWAUKEE, WIS., Sept. 6, 1915.

Evidence of the improvement in general conditions in Milwaukee is found in the building inspector's report for August, showing a gain of nearly 65 per cent in new construction, compared with the corresponding month of 1914. A small percentage is due to extensions of metal-working shops, although most of this work does not show in the report because the industries are not located within the city limits. Domestic inquiry for machine tools of all kinds continues brisk, while foreign business has slacked up somewhat, giving manufacturers time to complete deliveries on past bookings. All tool builders are working at top speed and so far see no relief from the greatly extended schedules. All other lines of the metal trades report improvement. William J. Fairbairn, secretary Milwaukee Metal Trades & Founders' Association, says all shops are running from 75 to 80 per cent of normal capacity, while many are operating overtime. The demand for skilled foundrymen, and even apprentices, is the best in many months. The demand for skilled machinists is in excess of the supply. The Milwaukee free employment office of the State Industrial Commission says that the physically fit man has no excuse for being out of work. Structural fabricators and erectors say business is picking up rapidly and much good trade is in sight.

W. R. Hirt, Wittenberg, Wis., has awarded contracts for a garage and repair shop, 36 x 64 ft., two stories, of iron clad construction.

The frame shop of the Central Welding & Cutting Company, 950 Douglas Avenue, Racine, Wis., was destroyed by fire and will be replaced with a brick building.

The Harmon Boiler Equipment Company, Milwaukee, has been organized by Rezeau B. Brown, Richard C. Munsche and A. H. Thierbach with a capital stock of $15,000. Mr. Brown is general manager and chief engineer of the Milwaukee Gas Light Company.

The Hoehne Machine Works, Kaukauna, Wis., have passed into the sole ownership of Ferdinand F. Hoehne, who has purchased the interest of the junior partner, Herman A. Knitter.

The Falls Machine Company, Sheboygan Falls, Wis., manufacturing internal combustion engines and specializing in automobile motors, is making radical changes in its plant in addition to building a new assembling shop. The gray-iron foundry is being dismantled and converted into a machine shop. Contracts have been entered into with gray-iron foundries at Grafton, Manitowoc and Racine, Wis., and Muskegon, Mich., for the future supply of castings, which until now were made at Sheboygan Falls. The company has taken contracts for delivering 12,000 engines by May 1 and as soon as changes and additions are completed, a night shift will be put on.

The C. Hennecke Company, iron and wire manufacturer, 1353 North Pierce Street, Milwaukee, is experiencing one of the busiest periods in its existence because of the revival of building operations. It has been awarded contracts for furnishing architectural and ornamental iron for no less than fifty structures, ranging in cost from $10,000 to $75,000.

John E. Molle has organized the Molle Typewriter Company, Kewaunee, Wis., with a capital stock of $500,000, and proposes to build a plant as soon as sufficient financial aid is procured. The incorporators are John E., William and Herman Molle. An experimental shop has been operated for some time.

The Belle City Malleable Iron Company, Racine, Wis., has concluded arrangements for the establishment of an electric steel foundry to be operated in connection with the present foundry at 1500 Kewaunee Street, Racine. It will at once erect a fireproof building, 80 x 160 ft., 30 ft. high, and intends to invest about $125,000 in the project. The work is in charge of A. Arthur Guilbert, architect, Racine. The current supply will be delivered under contract with the Milwaukee Light, Heat & Traction Company. The electric steel foundry is to be ready for operation about Dec. 1.

The Cluley Multiplier Company, Chicago, which recently arranged to establish its permanent plant in Green Bay, Wis., has been chartered to do business in Wisconsin. It is an Illinois corporation with $3,000,000 capital and a local interest of $20,000.

The Sivyer Steel Casting Company, Thirty-seventh Avenue and Mitchell Street, Milwaukee, has broken ground for a new shop addition, 75 x 90 ft., one story, of brick and steel. The work is in charge of Klug & Smith, consulting engineers, Milwaukee, who have sublet the steel work to the Milwaukee Structural Steel Company.

Hackendahl & Schmidt, Milwaukee, were awarded the contract for steel and iron work on the pattern vault and office addition for the Federal Malleable Company, Sixty-fourth Avenue, West Allis, Milwaukee.

William Van Lieshout has broken ground for a garage and machine shop on Lawe Street, Kaukauna, Wis., to be 50 x 100 ft. in size, of brick and steel construction, to cost $10,000.

C. E. Coon & Co., Cleveland, Ohio, have taken over the contract for the construction of the electric interurban lines of the Badger Railway & Light Company, Whitewater, Wis. The Raulf Company, Milwaukee, was the original contractor.

The Wisconsin Sugar Company, Menomonee Falls, Wis., is remodeling its plant at that point, the largest of its group, and installing considerable new power and sugar making equipment. The factories at Madison, Janesville and Chippewa Falls., Wis., closed because of sugar tariff reduction, are also preparing to resume production late in the year.

The Oil Gas Machine Company, Kenosha, Wis., has been organized with a capital of $25,000 to manufacture oil gas machines. Ernest O. Linton is president.

The Simple Gas Engine Company, Ashland, Wis., has been incorporated to manufacture gas engines by A. L. Preimesberger, C. A. Anderson and N. F. Thomas. It has a capital of $10,000.

The Sterling Wheel Company, Milwaukee, Wis., is building a plant for which a small quantity of equipment will be purchased. Theodore J. Smulski is superintendent.

Cleveland

CLEVELAND, OHIO, Sept. 6, 1915.

The domestic demand for machine tools continues heavy. It is well scattered and comes largely from manufacturers not engaged in making war material. All sizes of turret machinery are in heavy domestic demand for delivery next year. Less foreign business is being taken than recently, because builders are unable to make the early deliveries desired. Among new inquiries is one from the Henkel Company, Fremont, Ohio, maker of cutlery and manicure tools, for about 100 machine tools, including twenty turret lathes, ten screw machines, and a number of broaching machines. Information is lacking as to the purposes for which this machinery is required. Another Ohio inquiry is for twenty to twenty-four 16-in. lathes. Forging plants continue very busy with automobile work, although at this time of the year a falling off in orders from this source is usual.

The Cleveland Machine & Mfg. Company, Cleveland, will probably shortly begin the erection of a new plant to largely increase its present capacity. It is announced that a definite decision on the building project will not be reached for about two weeks.

The Hydraulic Pressed Steel Company, Cleveland, has taken a sub-contract from the Baldwin Locomotive Works for 2,500,000 75-mm. forged shrapnel shells for delivery to Russia during the next twelve months. This company has been doing a great deal of shrapnel shell work in the past six months and recently enlarged its plant. A further extension will be built. This order, which has been pending several weeks, is the largest shell order placed in Cleveland since the outbreak of the war.

The Lohse Automobile Improvement Company, Cleveland, has leased a factory building at West Seventieth Street and the Big Four Railroad and will fit it up for a machine shop and brass foundry. The company is now located at Euclid Avenue and East Fifty-fifth Street, but desires larger quarters. Matthew Ritz is president.

The Brown Spring Oiler Company, Cleveland, maker of oiling devices for automobile springs, has been incorporated with a capital stock of $10,000 by W. H. Brown and others.

The Cleveland Wire Cloth & Mfg. Company, which will shortly make some plant extensions, has increased its capital stock from $100,000 to $150,000.

The Cleveland Silver Manganese Metal Company, Cleveland, has been organized to manufacture white metal castings and has leased a plant at 9001 Desmond Avenue, formerly occupied by the Gordon Propeller Company. C. F. Johnson is president and Emil Kraus, secretary and treasurer.

The Kintner Mfg. Company, Cleveland, has been incorporated with a capital stock of $20,000 by G. I. Stevenson, W. J. Mahan, R. G. Morrison, and others, to manufacture hardware specialties.

The Harris Automatic Press Company, Niles, Ohio, has authorized an increase of capital stock to $1,150,000. No announcement has been made yet as to any extensions contemplated.

The Peerless Drawn Steel Company, Massillon, Ohio, which recently increased its capital stock from $100,000 to $200,000, will enlarge its plant by the erection of an extension to its main building, 60 x 152 ft.; a straight bar pickling building, 48 x 90 ft., and a wire pickling building, 20 x 110 ft. The addition to the main building will be of steel and concrete. The steel will be erected by the Massillon Bridge & Structural Company. Additional equipment will be installed. The extensions will enable the company to double its present capacity.

The Bonnot Company, Canton, Ohio, will erect a new machine shop, 40 x 60 ft.

The Ohio Fuel Supply Company, Mount Vernon, Ohio, is erecting a machine shop which will occupy a three-story building, 40 x 140 ft.

The Tomlinson Mfg. Company, Urbana, Ohio, will move to Canton, Ohio, through the efforts of the Canton chamber of commerce and will occupy one of the buildings of the Aultman plant. The company makes various sheet metal products and is a large consumer of tin plate. It is stated that it will employ about 100 men.

Detroit

DETROIT, MICH., Sept. 6, 1915.

The market for machine tools seems to be broadening and this by many is taken to indicate that almost all industrial lines in Detroit are in a very healthy condition. It is a fact that practically all of Detroit's major industries, with the exception of shipbuilding, are on a better basis than was the case a year ago. August, which is usually somewhat of a slack period among the automobile manufacturers, finds plants crowded with orders and working to capacity. Inquiry for standard tools continues strong, not only for new machinery but for second-hand equipment as well. Local foundries and machine shops, practically without exception, are well engaged.

The Auto Engineering Company, Detroit, manufacturer of automobile parts, is completing a factory with a floor space of 13,000 sq. ft. at 429-431 Bagg Street. It has contracted for its equipment requirements.

The Packard Motor Car Company, Detroit, has acquired a tract of 12 acres adjoining its present plant on the north. No announcement is made as to the use to which the tract will be put other than that it will provide room for future plant extensions. The company at present has seven new buildings under construction as follows: Machine shop, 100 x 400 ft.; wheel shop, 60 x 200 ft.; addition to truck department, 225 x 320 ft.; truck frame shop, 120 x 150 ft.; heat-treating building, 60 x 150 ft.; stamping department, 70 x 125 ft.; and an oil storage building, 60 x 120 ft.

The Scripps-Booth Motor Company, Detroit, automobile manufacturer, has purchased a factory site and has broken ground for a three-story building, which will permit of an output of 100 cars a day.

The Detroit Steel Products Company, Detroit, is preparing plans for an addition to its plant of approximately 15,000 sq. ft. It will be devoted to the manufacture of automobile springs.

The Parker Rust Proof Company of America, Detroit, has been incorporated with $100,000 capital stock to treat metals for the prevention of rust. The incorporators include Charles W. Parker, Wilman E. Parker and Joseph G. Johnson.

The Sturdevant-Murray Mfg. Company, Detroit, manufacturer of automobile parts, has increased its capital stock to $150,000 and has transferred its plant to a larger building, where its facilities have been greatly increased.

The Davey Mfg. Company, Detroit, has been incorporated with $25,000 capital stock to manufacture plumbing supplies. Charles E. Davey, Ferdinand J. Berschbach and Andrew W. Gibbons are the principal stockholders.

The flooring plant of the W. H. White Company, Boyne City, Mich., was destroyed by fire Aug. 28, entailing a loss of about $300,000. The matter of rebuilding the plant is under consideration.

The Flint Varnish Company, Flint, Mich., has awarded contracts for the erection of four buildings, which will double the capacity of the present plant.

The River Raisin Hydro-Electric Company, Monroe, Mich., has received permission from the Michigan Railway Commission to issue $30,000 of bonds, the proceeds of which will be used to enlarge and improve its power plant at Raisinville, Mich.

The Hardie Mfg. Company, Hudson, Mich., is erecting a building, 50 x 150 ft., which will be equipped for use as a machine shop.

The West Michigan Steel Castings Company, Muskegon, Mich., is building an addition to its plant, to cost $25,000; also an office building to cost $2,500. The capacity of the plant will be doubled.

The Nelson Brothers Company, Saginaw, Mich., manufacturer of gasoline engines and pump jacks, is erecting

an addition to its plant which will enable it to double its output.

The Consolidated Press & Tool Company, Hastings, Mich., has placed contracts for the erection of a plant which will include a large main building, a boiler-house and other small buildings.

The Central States Tanning & Belting Factory, a corporation recently organized with a capital of $50,000, has taken over the Krueger belt factory at Niles, Mich., and is having it overhauled and put in order for early operation. Some of the old equipment will be used.

The McCord Mfg. Company, Detroit, has purchased the brick factory of the Tilden Saw Company at Wyandotte, Mich., to which it will build an addition. It expects to devote this factory mainly to the manufacture of gaskets.

The Hastings Machinery Company, Hastings, Mich., has let contracts for its new factory and has purchased part of the machinery.

Plans have been made for the establishment of a factory to build power lawn mowers at Lansing, Mich. The project has been financed and will be incorporated with a capital of $50,000. The factory, when it opens, will be in charge of H. M. Verplanck and George R. Holmes.

The Westinghouse Electric & Mfg. Company has been awarded the contract for additions to the auxiliary steam plant of the Peninsular Power Company at Iron River, Mich. The contract includes a 2200-hp. generator and attachments, the installation of which will necessitate a large addition to the boiler capacity and enlargement of the station building.

Tecumseh, Mich., is having plans prepared for a water-works system to cost $15,000.

Indianapolis

INDIANAPOLIS, IND., Sept. 6, 1915.

The Mid-West Box Company, Anderson, Ind., has increased its capital stock from $100,000 to $225,000, and has issued preferred stock to the amount of $75,000.

The Dairy Queen Cream Separator Company, Lebanon, Ind., will erect a new building.

The Century Post Company, Indianapolis, Ind., has been organized with a capital stock of $5,000 to manufacture concrete machinery. The organizers are B. F. Cruesenbury, H. N. Elmore and I. Elmore.

The Atlas Foundry Company, Marion, Ind., will build a one-story addition, 60 x 150 ft., to cost $7,000. The floor of a cupola at the Atlas foundry recently gave way, entailing a loss of about $15,000.

The Walter Concrete Machinery Company, Indianapolis, has been incorporated with $50,000 capital stock by P. J. Hawkins, C. M. Cooper and N. M. Taylor.

The Safety First Device Company, Indianapolis, has been incorporated with $25,000 capital stock to manufacture auto devices. The directors are J. F. Noel, E. B. Earnhart and W. P. Earnhart.

The Welman Valve Company, Indianapolis, has been incorporated with $50,000 capital stock to manufacture valves. C. W. Welman, J. E. Bingham and Ray R. Ross are the directors.

The Shade-O-Lite Company, Indianapolis, has been incorporated with $25,000 capital stock to manufacture automobile searchlight dimming devices. The directors are F. W. Beauchamp, C. H. Thompson and R. F. Davidson.

The Salem Cabinet Company, Salem, Ind., has been incorporated with $25,000 capital stock to manufacture kitchen cabinets. Charles McClintock, F. P. Houk and J. W. Benham are the directors.

The Bournique Glass Company, Kokomo, Ind., has increased its capital stock from $19,500 to $85,000.

The DeKalb Mfg. Company, Auburn, Ind., has been incorporated with $150,000 capital stock to manufacture motor vehicles. The directors are William J. Allen, J. Vesey and Dick M. Vesey.

Birmingham

BIRMINGHAM, ALA., Sept. 6, 1915.

Business was slightly slower and smaller in volume the past week for some unknown reason. The general demand, however, for all sorts of supplies remains firm. Electrical apparatus and small gasoline engines as well as silage cutters and agricultural implements generally are quite active. The sawmill demand is also steady. Mines are purchasing pumps and engines. Business remains around normal with tendency to advance. Hope that cotton would be a good seller this fall has apparently given way to confidence in gradual marketing and at least fair prices. This has been a good tonic all around.

The Continental Gin Company will add to the capacity of its cotton gin making plant at Avondale, Birmingham. Details have not been announced.

The Troy Packing Company, Troy, Ala., has been organized with a capital stock of $60,000, of which $15,000 has been paid in, for the purpose of building a meat-packing plant. John Sanders, Milo, Ala., is president.

The Jerome Company, Gainesville, Ga., of which James J. Roberts is president, will establish a plant in Atlanta for the manufacture of cereals.

Blakeley, Ga., has voted $10,000 for establishing a municipal ice plant.

It is reported in Atlanta that a British syndicate headed by A. R. Oppenheim, New York City, has purchased for $400,000 a tract of land in Pickens County, Ga., carrying extensive potash deposits and will develop it.

It is reported in Macon, Ga., that the Co-operative Munitions, Engineering & Shipbuilding Company, Clermont Harbor, Miss., contemplates establishing a war munitions plant in Macon. The mayor of Macon is so informed.

The Bryan & Smith Timber Company, Riverdale, Fla., has been incorporated with a capital stock of $20,000 and has purchased 4200 acres of land. It will manufacture lumber and cross-ties.

Cincinnati

CINCINNATI, OHIO, Sept. 6, 1915.

Experienced machine-tool builders estimate that about 80 per cent of business now in hand is attributable either directly or indirectly to the war. Nearly all firms have contracts for machine tools that will keep their plants operating well into next year. A fact not generally known is that many shops are now working on old contracts taken before the advances in the prices of machine tools, although they are paying the higher wage schedule, and in some instances bonuses in order to increase production. Other increased manufacturing expenses include advances in the cost of both iron and steel castings, while the price of high-speed tool steel has been almost doubled in the past six months.

The foreign demand for machine tools is still somewhat slack, as compared with reports issued thirty days ago, and it is the general opinion that the crest of the wave of export business has passed. However, more orders could be obtained, no doubt, if satisfactory deliveries were possible. Many inquiries are out for shrapnel from so-called agents of foreign governments, but on investigation very few of them prove to be of a genuine nature.

The auto-truck manufacturers are all busy, with the possible exception of those making the smaller sized trucks for which there seems to be a more limited demand just now. The jobbing foundries are working at full capacity but the stove foundries are quite dull. Boiler and tank makers report an excellent demand for high-pressure tanks, and the boiler business is also improving.

Persistent rumors are circulated to the effect that the Pennsylvania Railroad Company will remove its repair shops from Columbus, Ohio, to Cincinnati. Other published reports have stated that the Pennsylvania Company had acquired the plant of the R. K. LeBlond Machine Tool Company, in East End, and would convert it into a repair shop. This report has been officially denied by R. K. LeBlond, president of the R. K. LeBlond Machine Tool Company, but he confirms the rumor that his company has tentative plans under way for building a new plant on a site secured in the eastern section of the city at some future time.

The Columbia Mfg. Company, 220 East Second Street, Cincinnati, manufacturer of children's foot-power automobiles and other specialties, is adding to its manufacturing facilities. In the list of equipment wanted is one 25-hp. gas engine, one small double-acting power press and other special machines. J. M. Crowe is president.

The Dalton Adding Machine Company, Norwood, Cincinnati, has closed its plant indefinitely, due to a demand from its workmen for a 48-hr. week, instead of a 50-hr. week, on which time the plant formerly operated.

C. W. Handman, business manager, Board of Education, Cincinnati, will open bids on Sept. 20 for heating boilers, metal lockers, etc., for a high school to be erected in Hyde Park.

The Dayton Pneumatic Tool Company, Dayton, Ohio, will soon move into a factory building now under construction on Hartford Street. It will be of steel and brick construction and will enable the company to more than double its present output.

The Elwood Myers Company, Springfield, Ohio, recently let contract to the Frank H. Smith Construction Company,

Springfield, for a seven-story addition to its plant, and work is now well under way.

The Ohio Wax Paper & Printing Company, Columbus, Ohio, has decided to add to its manufacturing facilities. Nothing is known as to machinery requirements.

It is rumored that plans are under way for reorganizing the Columbus Machine Company, Columbus, Ohio, which has been in the hands of a receiver for some time past, but details are lacking at the present time. It is reported that a war contract is under consideration by the company.

The Dunlap Engineering Company, Columbus, Ohio, whose reorganization plans were recently mentioned, is completing plans for starting work on the manufacture of lathes. No new equipment is needed.

The Rundle Novelty Company, Columbus, Ohio, manufacturer of juvenile vehicles, has commenced work in its new factory on North Third Street. Very little additional equipment will be required.

The Norton Iron Works Company, Ashland, Ky., is making an addition to its plant that will be 65 x 120 ft., one story, of brick, steel and concrete. It will be used to house the wire fencing department.

The Fearon Lumber Company, Ironton, Ohio, will make some additions to its plant for which special equipment will be required.

The Ramey Company, Chillicothe, Ohio, manufacturer of electrically-operated vacuum cleaners, expects to increase its manufacturing facilities at an early date.

The Central South

LOUISVILLE, KY., Sept. 6, 1915.

Business in machinery and other branches of the iron trade is holding up in good style. Practical assurance has now been given that the banks will finance the cotton crop, and this is bringing about a feeling of greater confidence among business men in the South. Consequently numerous important projects may now be expected to materialize. The increased volume of building in this territory is one of the best indications of improved conditions. Demand for boilers continues good. Electrical manufacturers report that small motors are in the best demand at present. Exhaust steam ice machines are selling. Oil engines are also moving better now than for some time.

Bailey & Baumgarten, Fourth and Walnut streets, Louisville, are considering installing an ice machine.

H. P. Salman & Co., Fourth and Walnut streets, Louisville, are reported to be considering the installation of a private lighting plant operated by an oil engine.

The Henry Vogt Machine Company, Louisville, has decided to double the capacity of its drop forging department, and will install additional hammers and other equipment. Most of the machinery has already been bought.

The Hawesville Water & Light Company, Hawesville, Ky., has been incorporated with $12,000 capital stock by W. H., Nettie L. and Charles C. Williams.

The Board of Education, Georgetown, Ky., has announced plans for the equipment of a manual training department. Wood-working, machine shop practice, etc., will be taught.

M. D. Robinson, Henderson, Ky., will purchase refrigerating and bottling equipment for a dairy plant.

The Fayette Produce Company, Lexington, Ky., has been formed by M. B. Jacoby and J. W. Lynch. It will install refrigerating equipment.

The Kentucky Block Coal Company, Hazard, Ky., is in the market for retarding conveyors, shaker screens, a motor generator and other equipment.

Final details regarding the establishment of a dyestuffs plant in Kentucky indicate that it will be built by the Pearsite Company, Oliver Building, Pittsburgh, Pa., and located at Caney, Ky. It will be experimental in character until the results of the use of oil from cannel coal have been finally determined.

The Prather Demountable Wheel Company, Georgetown, Ky., has been organized with $40,000 capital stock and has elected M. B. Sinsworth, president; Asa P. Prather, vice-president; Oklahoma Prather, secretary, and J. C. Prather, treasurer. It recently established a factory for the manufacture of a patented demountable automobile wheel.

Henderson, Tenn., which approved a bond issue of $13,000 for the erection of an electric light plant, will be in the market for equipment shortly. J. I. Galbraith is mayor.

M. C. King, and others, Copperhill, Tenn., have been awarded a franchise for the operation of an electric light system at Madisonville, Tenn., and will begin the construction of a plant.

The Chattanooga Gas & Coal Products Company, Chattanooga, Tenn., is reported to have plans for the installation of another battery of coke ovens and for the establishment of a benzol by-product plant, to cost altogether $150,000.

The Nashville Bridge Company, Nashville, Tenn., has completed arrangements for the manufacture of shrapnel, and will begin operations in that line as soon as additional machine tools recently ordered have been installed. J. H. Corbitt is secretary.

The Brantley & Ellis Automobile Company, Nashville, Tenn., is in the market for an alternating current motor or gasoline engine and for an air compressor.

The Chattanooga, Tennessee River Power Company, Chattanooga, Tenn., has announced plans for the construction of a water-power plant on Duck River near Shelbyville, Tenn.

The Nashville, Chattanooga & St. Louis Railroad, general offices in Nashville, Tenn., has announced that $100,000 will be expended in the construction of car shops at Chattanooga to be used for repair work. A power-operated incline will also be built at Chattanooga. H. McDonald is chief engineer.

H. E. Jones, Bristol, Tenn., will build an automobile garage and repair shop.

St. Louis

ST. LOUIS, MO., Sept. 6, 1915.

The machine tool market steadily but still rather slowly grows better in tone and demand. No large lists are appearing because of the absence of war business in this territory. War business elsewhere continues to prevent deliveries and dealers are as hard put to it in their current business as they would be ordinarily if the orders were larger. Few second-hand tools are to be found and the same is true of rebuilt equipment. Dealers view the future optimistically and look for further improvement, now that the crop conditions are practically assured. Collections continue good and money is easy at the banks with increasing tendency to finance industrial enterprises.

The Pittsburgh-Stewart Heater & Filter Company, St. Louis, Mo., has been incorporated with a capital stock of $15,000 by David B. Morrison, William F. Stewart and Edward H. Barstow to manufacture water heaters and filter equipment.

Russell E. Gardner, St. Louis, Mo., president of the Banner Buggy Company, has announced that he and others will at once begin the equipment of a plant for the manufacture of automobiles.

The Instanter Water Heater Company, St. Louis, Mo., has been incorporated with a capital stock of $100,000 by Andrew O. Shrader, John H. Magner and John O. McSalley to manufacture water heating appliances.

The Velie Automobile Company, St. Louis, Mo., has been incorporated with a capital stock of $17,500 by Herman L. Schnurr, Alexander Steiner and William L. Hausmann.

The Ford Motor Company's assembling plant at St. Louis, Mo., will be doubled in capacity at once at a cost of $250,000, largely for equipment utilized in assembling and repair work.

The Equitable Powder Company and the Western Cartridge Company have plans for the equipment of a large cartridge factory in St. Louis. The companies have plants at Alton, Ill. F. W. Olin is president.

The Missouri Forest Products Company, St. Louis, Mo., has been incorporated with a capital stock of $16,000 by L. and A. H. Boller and Fred Billmeyer and will equip a wood-working plant.

The All Steel Motor Company, Macon, Mo., will equip for the manufacture of automobiles. The company has a paid-in capital of $400,000. E. J. Spencer, St. Louis, Mo., is president.

Bevier, Mo., will expend $15,000 for increasing the equipment of its electric lighting plant.

The St. James Ice, Electric & Power Company, St. James, Mo., has been incorporated with a capital stock of $40,000 by H. W. Alverson, J. F. White and John Boggs.

The Lautz-McNerney Quarry Company, Carthage, Mo., will install about $40,000 worth of new machinery, increasing its capacity by seventeen machines for dressing marble.

Herman Jones, Joplin, Mo.; E. R. McClelland and M. R. Perry, Kansas City, will equip a concentrating plant at Duenweg, Mo., costing about $37,000, including one 165-hp. engine, one 150-hp. engine, compressor, etc.

The Batesville Mining Company, Frisco Building, Joplin, Mo., of which D. C. Dorr is president, will open bids for power and mining machinery Sept. 20.

Macon, Mo., J. L. Martin, city clerk, will open bids Sept. 14 for filter plant equipment of 700,000 gal. capacity, two centrifugal pumps of 500 r.p.m. with motors, one motor-

driven centrifugal pump of 500 gal. per minute capacity, one motor-driven centrifugal pump of 400-gal. per minute capacity with 7½-hp. motor, condenser, separator, etc., for its waterworks.

The Hannibal Wire Fabric Company, Hannibal, Mo., will spend $20,000 on its new plant, which will be erected at once.

The Frisco Stave Company, Corning, Ark., will establish a tight barrel plant of 20,000 staves daily capacity. The Cate La Nieve Company, Jonesboro, Ark., is owner.

The Equitable Powder Company's mill at Cornish, Ark., has been destroyed by fire and explosion.

The Farmers' Gin Company, Loco, Okla., has been incorporated with a capital stock of $12,500 by A. G. Robertson, Robert C. Whitten and C. B. Florence.

Jones, Okla., will expend $10,000 for increasing the capacity of its electric light plant and waterworks pumping station. The Benham Engineering Company, Oklahoma City, Okla., is the engineer.

The Mid Continent Refining Company, Jennings, Okla., will build a refinery with a daily capacity of 2000 bbl. The Jennings Business Club should be addressed.

The North American Refining Company, Oklahoma City, Okla., has been incorporated with a capital stock of $250,000 by C. F. Colcord, Irving H. Wheatcroft and John Maney and will equip a refining plant for oil.

The State Board of Affairs, McAlester, Okla., will build and equip a factory at the State penitentiary at McAlester. The board should be addressed at Oklahoma City.

A pumping station, filters, etc., including two 8 x 10 triplex pumps, two 4-in. centrifugal pumps, two 50-hp. oil engines, etc., will be equipped at Caddo, Okla., under the supervision of J. E. Davis, city engineer.

The Southwestern Power, Light & Railway Company, Security Building, Oklahoma City, Okla., of which W. T. Creslen is president, is reported about to enter the market for about $1,000,000 of equipment for three hydro-electric plants developing 23,500 hp.

The Tennessee & Mississippi Mfg. Company, Columbus, Miss., is in the market for steel cutting and corrugating equipment and other machinery. James A. Fuson is president.

The Safety First Automobile Company, Indianalo, Miss., is reported in the market for gasoline engines and other equipment. J. H. Evans is manager.

The planing mill of the Duss-Hetzler, Clarksdale, Miss., has been burned with a loss of $75,000. The equipment will be replaced.

Wesson, Miss., will install equipment for its waterworks and electric light plant under the supervision of M. L. Culley, Jackson, Miss.

Whitecastle, La., will expend $25,000 in the equipment of a municipal electric light and waterworks plant. X. A. Kraller, Magnolia, Miss., is in charge.

The Board of Port Commissioners, New Orleans, La., will receive bids until Sept. 15 for elevator construction and equipment, the capacity to be 100,000 bu. per hour for loading ships.

The Self-Greasing Buggy Company, St. Louis, Mo., has been incorporated with a capital stock of $25,000 by Frank J. Brune, John T. Gins and William F. Schmand to manufacture vehicles.

The Steelville Electric Light & Power Company, Steelville, Mo., has been incorporated with a capital stock of $10,000 by John Zahorsky, Jr., A. H. Harrison and W. E. Evans and will equip a public service plant.

Texas

AUSTIN, TEX., Sept. 4, 1915.

Machinery and other repairs to industrial plants that were made necessary by damage which was done by the recent hurricane that swept over a portion of the Gulf coast are progressing rapidly and manufacturing conditions will be restored to normal within a short time. Notwithstanding the losses to the cotton crop, which the storm caused, it is estimated that the State's total yield will be close to 4,000,000 bales.

The chamber of commerce, Temple, is promoting the construction of a large silo manufacturing plant.

The Italy Gin Company will build a cotton gin at Italy at a cost of about $10,000. H. C. Carter is a stockholder.

R. W. Randolph, Austin, will build a garage and repair shop.

The Renner Farmers' Gin Company, Renner, will build a cotton gin to cost about $10,000. F. W. Jackson is a stockholder.

The Compress Buckle Company, Fort Worth, has been organized with a capital stock of $20,000 to manufacture compress buckles. J. A. Todd is one of the organizers.

The Kyle Light & Power Company, Kyle, is being organized to build an electric light and power plant. W. W. Giesen, San Marcos, is one of the promoters.

At a recent meeting of the stockholders of the Southwestern Portland Cement Company, held at its headquarters in El Paso, the construction of a new cement manufacturing plant at Victorville, Cal., to cost $500,000 was authorized. The proposed plant will have a daily capacity of 1500 tons of cement.

Swift & Co., will rebuild their cold storage plant at El Paso which was recently damaged by fire. W. E. O'Connor is superintendent of construction.

The city commission recently purchased the local waterworks plant at Mineola and plans have been adopted for improvements which will be made at a cost of $25,000.

Hall Robinson, Tahoka, will build a garage and repair shop.

E. E. Allen, Sherman, will build a plant for manufacturing wrenches and other small tools.

The Texas & Pacific Railroad will build an addition to its shops at Marshall at a cost of about $15,000.

The Luck Tire & Mfg. Company plans to build a plant at San Antonio to cost $100,000 for the purpose of manufacturing pneumatic puncture-proof automobile tires.

The State Penitentiary Commission is considering plans for making extensive improvements and a rehabilitation of iron furnace, pipe works and other branches of the State's iron industry at Rusk. It is estimated that it will require about $250,000 to place the industry on the proper footing.

San Francisco

SAN FRANCISCO, CAL., Aug. 31, 1915.

While the local demand for machine tools is anything but active, business is now limited rather by lack of stock than of demand. Some merchants are getting delivery on tools ordered some months ago, but say they are practically all sold before leaving the factories. A few good-sized inquiries, on which business is expected, have appeared in connection with development work in the interior; but many orders have been definitely held up until better bargains can be had. It is understood that buyers for the belligerent nations have been scouring the market in search of desirable tools, and that some sales have been made from stock. It is impossible, however, to verify the frequent rumors of large sales of tools and machinery, of which no evidence can be found in the scale of shop operations. The occupation of Eastern shops on war business, however, is beginning to divert occasional orders for miscellaneous equipment to Pacific coast manufacturers, which is causing a little better feeling. The general demand is slow to revive, but some slight improvement is noticed.

The shops and roundhouses of the Nevada County Narrow Gauge Railroad at Grass Valley, Cal., were destroyed by fire Aug. 30, with an estimated loss of $75,000.

Considerable interest is taken in the report of the letting of a contract by the Interisland Navigation Company, Honolulu, to the C. W. Hunt Company, New York City, for the construction in Honolulu harbor of a coaling plant of 165,000 tons capacity.

The Mammoth Copper Company is starting work on the reconstruction of the compressor plant, including transformers and motors, at the Stowell mine, Kennett, Cal. The old plant was burned Aug. 20.

The Samson Iron Works, Stockton, Cal., is opening a branch at Porterville, Cal.

O. C. Haslett is starting the construction of a sawmill in Plumas County, near Quincy, Cal.

The Ort Iron Works, San Diego, Cal., has been incorporated with a capital stock of $25,000 by J. C. Ort, J. C. Ort, Jr., E. Thomas, F. Van Horst and J. H. Moore.

It is reported that the California Manganese Company, Patterson, Cal., has changed hands, and will build an electric furnace and ferromanganese plant, with by-product factories and 21 miles of narrow-gage railroad. The new owners are residents of Honolulu.

A. Cerveau, Los Banos, Cal., is preparing to open a small machine shop.

A small list of machine tools for the Orange, Cal., high school has been divided among Harron, Rickard & McCone; the Smith-Booth-Usher Company; the Terry Engineering Company, the Pacific Tool & Supply Company, and the Eccles & Smith Company.

The Pacific Northwest

SEATTLE, WASH., Aug. 31, 1915.

A number of sales are recorded for the past week in contractor's equipment, boilers and power machinery. The great number of municipal light and power plants in the Northwest that have been undertaken so far this year have caused a brisk demand for this line. Municipal improvements are keeping up unusually well. The large amount of paving repairs required in Northwestern cities has justified the establishment of a number of municipal paving plants.

That Alaska is entering on a new period of development is shown by many significant facts. Additional ships are required constantly to care for the shipments of merchandise, equipment and machinery sent there. Aside from gold mining, which is unusually active, new sawmills, coal mining, and road building require a large quantity of supplies. Seattle and vicinity get the bulk of this business, which has helped materially to keep the machinery business at its normal condition.

The plant of the L. H. Stover Sawmill Company, Union, Ore., was completely destroyed by fire recently with a loss estimated at $25,000. It is reported plans are already under way for rebuilding it.

The Drayton shingle mill at Blaine, Wash., has been sold to the Blaine Mfg. Company for $20,000. The new owners will install machinery to increase the capacity and overhaul it for operation.

The Washington Potash Company, Seattle, Wash., was recently incorporated with capital stock of $25,000 by M. J. Falkenburg, I. F. Lauck and V. B. Matheson.

The Bailey Garage & Machinery Company, Seattle, Wash., has been incorporated with a capital stock of $20,000, by John W. Bailey and John F. Scearce.

The steamer Rose City, owned by the Portland & San Francisco Steamship Company, Portland, Ore., will be equipped with four Ballin water-tube boilers and other equipment at a cost of $50,000.

Everett, Wash., has authorized the City Council to investigate the feasibility of constructing a power plant to generate current by water power from the Sultan River. A plant with 60,000 hp. capacity is under consideration.

The plant of the Pioneer Box Company, Hillyard, Wash., has been sold to Samuel Carlin of that city, who will make repairs and add new machinery.

The Hood River Mfg. Company, Hood River, owned by C. A. Bell and others, plans the construction of a one-story factory, 50 x 100 ft., to manufacture spray nozzles, etc.

The Youman's Ford Lock Company, Vancouver, Wash., has been incorporated for $25,000 by B. F. Youmans, J. M. Hoff and George B. Simpson. It plans to erect a plant for the manufacture of a patent lock for Ford automobiles.

The Unit Brick & Tile Company, Seattle, Wash., has filed incorporation articles with capital stock of $150,000. Clinton P. McCormick, James A. Murphy, Jay H. Hughes and others are the incorporators.

The Spokane Ornamental Iron & Wire Works, Spokane, Wash., is to be reorganized and new capital invested. To this end, temporary assignment of the company's interests has been made to the Spokane Merchants Association. The company's plant will be overhauled, new machinery installed to increase the capacity, and put into operation at once.

Canada

TORONTO, Sept. 4, 1915.

The Northern Canada Power Company, Porcupine, Ont., will spend $1,000,000 to increase the capacity of its power plant.

Machinery to cost $27,000 has been purchased by the plant of the Truro Engineering Company at Truro, N. S.

Extensions are being made to the Dominion Arsenal at Quebec, Que.

The Union Twist Drill Company, Sherbrooke, Que., which purchased the twist drill and other tool shops of Butterfield & Co., at Rock Island, Que., is building an addition to them.

McKinnon & Holmes, Sherbrooke, Que., are building an addition to their plant for the manufacture of shells, etc.

The Canada Machinery Corporation, Galt, Ont., will build an addition to its plant.

The Chevrolet Motor Company, Tarrytown, N. Y., will shortly build a factory at Toronto, Ont. The company is capitalized at $500,000.

The Canadian Western Foundry & Supply Company, Ltd., Calgary, Alberta, has received an order for $6,000,000 worth of shells, and is contemplating a plant for the manufacture of them.

It is announced that the Canadian Pacific Railway Company is contemplating the erection of a large plant at Calgary, Alberta, for the manufacture of shells. Vice-president J. S. Dennis is expected in Calgary soon.

Thomas Garnett & Sons, Port Hope, Ont., have received the contract for the erection of a foundry for the D. Barker Foundry Company, Ltd., at Brighton, Ont., to cost $13,000.

St. Hyacinthe, Que., is contemplating the instalation of two pumps, motors, boilers, etc., to cost $75,000. H. E. Wardroper is clerk.

A waterworks system to cost $12,000 is being installed at Thedford Mines, Que. Material is being purchased by J. L. Demers, Notre Dame Street, Montreal.

Thomas Wooster, Aylmer, Ont., is in the market for boilers and other greenhouse equipment.

E. O. Baldwin, Cutting Street, Coaticook, Que., will shortly be in the market for hoisting and carrying cranes.

The Collingwood Shipbuilding Company, Collingwood, Ont., is refitting part of its plant for the manufacture of shells and high explosives.

Burnall, Ltd., Toronto, Ont., has been incorporated with a capital stock of $100,000 by William H. Latimer, 46 Breadalbane Avenue; Norman F. Newton, 157 Bay Street; John Callahan and others of Toronto to manufacture fuel savers, smoke consumers, machinery for heating plants, etc.

The R. F. Simmons Company of Canada, Ltd., Toronto, Ont., has been incorporated with a capital stock of $40,000 by Henry T. Woodroofe, 95 King Street East; Arthur W. Burk, Albert Burnese and others to manufacture jewelry, watches, etc.

The W. H. Storey & Son, Ltd., Acton, Ont., has been incorporated with a capital stock of $100,000 by George M. Willoughby, 27 Willcocks Street; Francis H. Hurley, Joseph M. Bullen and others, all of Toronto, Ont., to manufacture leather goods, etc.

N. M. Paterson & Co., Ltd., Winnipeg, Man., has been incorporated with a capital stock of $400,000 by William F. Roche, Fort William, Ont.; Norman M. Paterson, John S. Blair, Winnipeg, and others to build elevators, etc.

The Excel Chemical Company, Ltd., Montreal, Que., has been incorporated with a capital stock of $1,000,000 by Eugene H. Godin, Lasalle, Que.; Joseph E. Morier, Arthur Courtois and others to manufacture high explosives, etc.

The Patent Gates Company, Ltd., Sorel, Que., has been incorporated with a capital stock of $50,000 by Arthur Langlois, Francis Hurtubise and others.

The Russell Fire Proofing, Ltd., Russell, Ont., has been incorporated with a capital stock of $250,000 by Andrew Walker, Hiram Kenney, James A. Cochrane and others to manufacture brick, tile, etc.

E. T. Ramsay, Ltd., Montreal, Que., has been incorporated with a capital stock of $50,000 by Edward T. Ramsay, Westmount, Que.; Harry S. Thompson, St. Lambert, Que.; Joseph A. LaBrecque and others to manufacture brick, etc.

The Flexible Metal Hose Company, Ltd., Ottawa, Ont., has been incorporated with a capital stock of $200,000 by John Worthington, Pembroke, Ont.; James B. Watson, F. E. Higgerty and others of Ottawa, Ont., to manufacture flexible pipe joints, air and steam heads, etc.

The plant of the Hardware Specialties Company, Pembroke, Ont., which was recently destroyed by fire with a loss of $45,000, will be rebuilt.

The Canadian Northern Railway Company has settled its differences with the city of Vancouver, B. C., and will shortly commence work on its terminals and seawall there to cost about $5,000,000.

The Metal Products Company, New Westminster, B. C., has been incorporated with a capital stock of $30,000 to manufacture steel windows, structural ironwork, light and heavy machinery, brass and iron goods, etc.

The Widdess McDonald Company, Ltd., Vancouver, B. C., has been incorporated with a capital stock of $10,000 to manufacture machinery, metal goods, etc.

The ratepayers of East Kildonan, B. C., passed a by-law to raise $41,000 for extensions to be made to the water works system.

That there is no distinction between employees engaged by the week, day or hour, in so far as the Maryland State Industrial Accident Commission is concerned, is set forth in an opinion handed down by that body. It is ruled that dependents of employees injured or killed while working by the hour are entitled to compensation on the same basis as employees engaged by the day, week or other periods.